ENGINEERING
NEWS-RECORD

AUG. 17, 1961

PRICE 50 CENTS

CONTENTS ON PAGE 17

Fitting Cities to the Future

Norfolk makes a bid for prosperity p. 32

Concrete crosses carry building loads p. 46

A McGRAW-HILL PUBLICATION

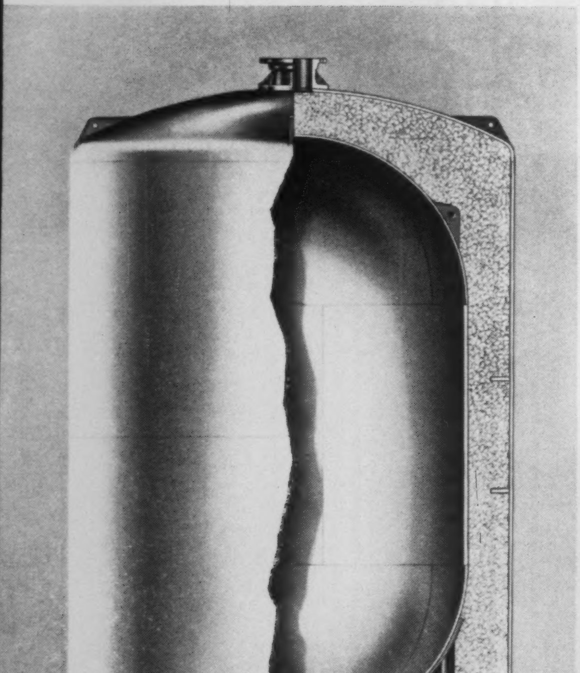
FOR AIRCO

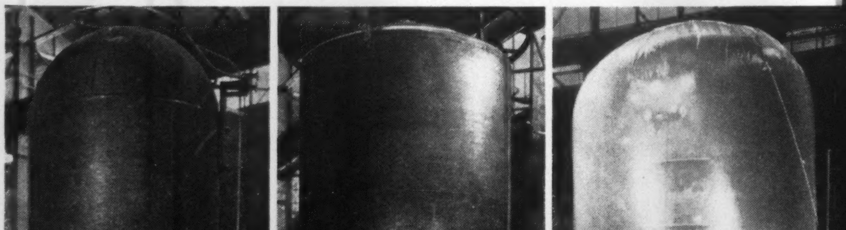
43 LIQUID OXYGEN TANKS

BY PDM

These 9% nickel 5850-gallon insulated liquid oxygen storage containers are now serving AIR REDUCTION customers around the country in the fields of missiles · steel · chemicals · metal fabrication.

This large order from Air Reduction Sales Company reflects the nationally recognized ability of Pittsburgh-Des Moines Steel Company to handle cryogenic storage vessel fabrication on schedule, to the most exacting specifications. Each of these units, supplied by AIRCO for in-plant customer use, consists of a 9% nickel inner tank 9′ dia x 16′3″ high, contained in a carbon steel outer tank 11′6″ x 20′ with vacuum-perlite insulation. The inner tank, built to ASME code, is grit-blasted, 100% X-rayed, nitrogen purged and stress relieved, hydrostatic tested, dried by hot filtered air and Freon de-greased. • May we quote on your requirements?





Left to right: Cutaway view of liquid oxygen unit, showing 9% nickel inner shell and vacuum-perlite insulation. · Inner tank under construction. · Shop view of carbon steel outer tank. · Completed unit undergoing mass spectrometer helium leak test.

PDM
STEEL STORAGE TANKS

PITTSBURGH-DES MOINES STEEL COMPANY

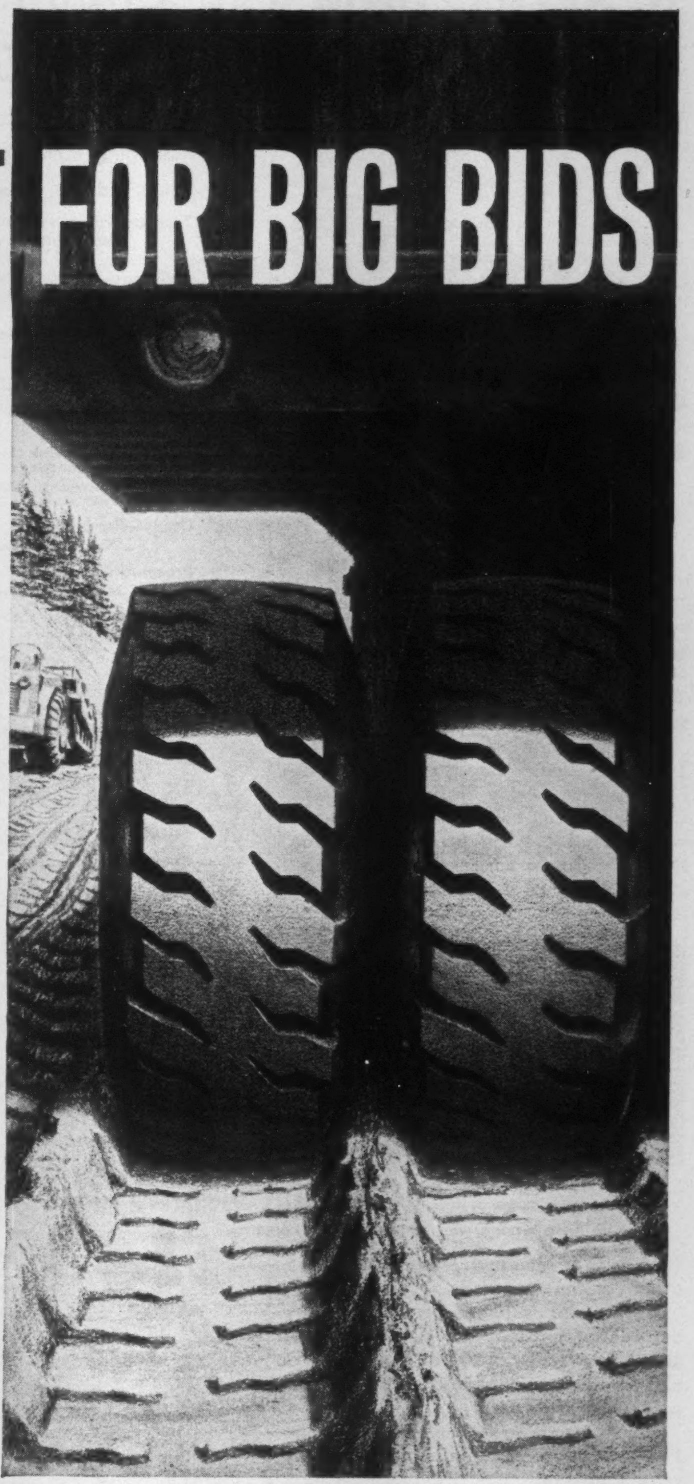
Plants at PITTSBURGH, WARREN, BRISTOL, PA. • BALTIMORE • BIRMINGHAM • DES MOINES
PROVO, UTAH • CASPER, WYO. • SANTA CLARA, FRESNO, STOCKTON, CALIF.

PITTSBURGH (25)	Neville Island	EL MONTE, CALIF.	P.O. Box 2012
WARREN, PA.	P.O. Box 660	NEW YORK (17)	200 East 42nd Street
BALTIMORE (26)	P.O. Box 3459, Curtis Bay Station	NEWARK (2)	744 Broad Street
BIRMINGHAM (8)	P.O. Box 8641, Ensley Station	CHICAGO (3)	679 First National Bank Bldg.
DES MOINES (8)	1015 Tuttle Street	ATLANTA (5)	361 East Paces Ferry Rd., N.E.
PROVO, UTAH	P.O. Box 310	DALLAS (1)	Suite 1703, Southland Center
SANTA CLARA, CALIF.	P.O. Box 329	DENVER (2)	323 Railway Exchange Bldg.
SEATTLE (1)	500 Wall Street		

GOODYEAR

BEST BET FOR BIG BIDS

Let Goodyear show you ways to cut your tire costs



Competition for big jobs keeps you on your toes. That's why it pays to do everything possible to protect your profit margin. And much of your success on the big jobs rides on the tires you use.

Your Goodyear Big-Tire Specialist knows what problems you face in terrain, roads, climate, schedules and speeds. And he knows which tire is best for each need and how to keep costs in line. When you call him in for an analysis, you are assured his recommendations on tires will come from the most complete line of the world's toughest earthmover tires.

He's ready with On-The-Job Service whenever you need it. Goodyear Contractor Service means that you can have a tire-maintenance program on-the-job. This service is geared to save man-hours, machine-hours and tire life.

Plus — BIG-TIRE PERFORMANCE
Example: SUPER ROAD LUG

Jounce it over the roughest terrain and the Goodyear Super Road Lug shrugs off flexing, cuts and piercing blows. Reason? This tire embodies new and advanced super-toughening agents that make it super-tough on wear. What's more, rugged 3-T Processed Cord (nylon or rayon) — triple-tempered by Tension, Temperature and Time — give you unequalled tire strength and stamina.

Why not get the full story on the performance and savings that make the Super Road Lug your best bet for big jobs — and details on Goodyear Contractor Service — *before* your next bid. Just call your Goodyear dealer — or write Goodyear, Truck Tire Department, Akron 16, Ohio. Remember, lots of good things come from Goodyear.

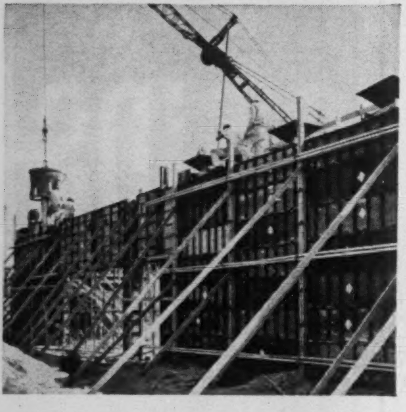
Road Lug — T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Buy and Specify Truck Tires by

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

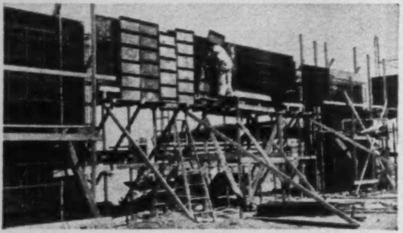
Decorative Walls



Horizontal gang forming with Symons steel-plys saves material and labor

Decorative outside walls, requiring V-scoring at 8-foot intervals, were poured with Symons Steel-Ply Forms by contractor MacIsaac & Menke, Los Angeles. The job—General Telephone of California's new offices in Norwalk.

Like many other contractors, MacIsaac & Menke consulted with The Symons engineering staff to determine if gang forming could be used. Symons recommended gang forming Symons Steel-Ply Forms *horizontally*, and using ½ inch standard V-joints at 8-foot spacings. Using this system the job could be (and was) poured in much less time than other common methods.



Workman setting Symons Steel-Ply Forms in place on section of building where gang forming was not required.

Because all problems were worked out before starting the job, there was considerable savings in material and labor; and forming, pouring and stripping time was cut substantially.

For the *complete story, write us*. Symons Forms can be purchased outright or rented with purchase option.

S ® Symons

SYMONS CLAMP & MFG. CO.

4265 Diversey Ave., Dept. H-1, Chicago 39, Ill.

Warehouses Thruout the U.S.A.

MORE **SAVINGS** FROM **SYMONS**

ENGINEERING NEWS-RECORD

EIGHTY-SEVENTH YEAR OF PUBLICATION

A McGraw-Hill Publication • 330 West 42nd Street, New York 36, N.Y. • LOngacre 4-3000

Editor, Waldo G. Bowman

Managing Editor, **Arthur J. Fox, Jr.**

Senior Editors, **Frederick S. Merritt, James B. Sullivan, Leo J. Ritter, Jr.**

Transportation—Roads, Bridges, Railways, Airports, Pipelines, Ports
Leo J. Ritter, Jr., Edward M. Young, Jr., Joseph F. Wilkinson

Buildings—Commercial, Industrial, Housing; Codes, Specifications
Frederick S. Merritt, C. W. Griffin, Jr., Ronald G. Burns

Water—Sanitation, Water Supply, River Control, Power, Irrigation
James B. Sullivan, William W. Jacobus, Jr., Robert M. Echols

Business—Management, Labor, Finance, Markets, Contracts, Economics
Robert J. Stinson, Charles J. Harding

Regional Editors
J. Roland Carr, *Chicago, 645 N. Michigan Ave.* (*MOhawk* 4-5800)
Martha Alexander, *Staff Assistant*

Lauress L. Wise, *San Francisco, 255 California St.* (**DOuglas 2-4600**)
Anne Garcia, *Staff Assistant*

Copy—Production
Nancy Parkes, John C. Greenough, E. Allen Soast

Presentation
Harry W. Jensen, Robert G. Young

Statistics, Prices, Costs—Business News
Elsie Eaves, *Manager*
Julia Mahoney, *Construction Reports*
Mildred Wetzel, Marian Sciorra, Marie Moravsik
Eleanor Queret, Francine Todisco, Helene Wahlers, Arlene Spielman
James Webber, Ruth Carlson, *Economics*
William P. Larkin, T. M. Crosio, *Prices, Wages, Indexes*
Evelyn Huber, Edith Ostwald, *Statistics*
D. Arlene Ricker, *Unit Prices*

Editorial Research and Indexing
Eva Gierat, Rene Hay, Jane Jacobson

Consulting Editors: **Van Tuyl Boughton, Nathan A. Bowers**

Advertising Sales Manager: **Donald S. Robertson**

Circulation Manager: **Edward F. Bressler**

Washington Bureau, National Press Bldg., Washington 4, D. C., (*REpublic* 7-6630), George B. Bryant, Jr., Chief, Alan Adams, Glen Bayless, Herbert Cheshire, Boyd France, Charles Gardner, Arthur Hermann, Donald Loomis, Daniel McCrary, Gladys Montgomery, Arthur Moore, Burkey Musselman, Seth Payne, Morton Reichek, Caroline Robertson, David Secrest, Richard Smith, Vincent Smith, Harry Vandernoot, Peter Weaver

Domestic News-Bureaus: Atlanta—1375 Peachtree St., **B. E. Barnes,** Chief, Frances Ridgeway; **Chicago**—645 N. Michigan Ave., Stewart Ramsey, Chief, Bruce Cross, Eric Aiken; **Cleveland**—55 Public Square, Arthur Zimmerman, Chief, Violet Forsha; **Dallas**—2100 Vaughn Bldg., Marvin Reid, Chief, Mary Lorraine Smith, Mae Brown; **Detroit**—856 Penobscot Bldg., Donald MacDonald, Chief, Wesley Perry, Jr., Del Yannatta; **Los Angeles**—1125 W. 6th St., Kemp Anderson, Jr., Chief, Carl Havighorst, Michael Murphy, Marvin Petal, Bill Wallace, Mary Williams, Barbara Lamb; **San Francisco**—255 California St., Jenness Keene, Chief, Donald Winston, Marion Tracy; **Seattle**—6040 Fifth Ave., N.E., Ray Bloomberg.

Foreign News Bureaus: London—John Shinn; **Paris**—Robert Farrell; **Mexico City**—John Pearson; **Bonn**—Pete Forbath; **Tokyo**—Sol Sanders; **Rio de Janeiro**—Leslie Warren; **Moscow**—Ernest Conine.

Correspondents: In 70 principal U. S. cities and 70 cities throughout the world.
Director of News Bureaus: John Wilhelm; **Managing Editor, Margaret Ralston.**
McGraw-Hill Economics Department: Douglas Greenwald, Manager.

ABP ABC

MEMBER

Publisher, Robert F. Boger

ENGINEERING NEWS-RECORD Vol. 167, No. 7, AUGUST 17, 1961

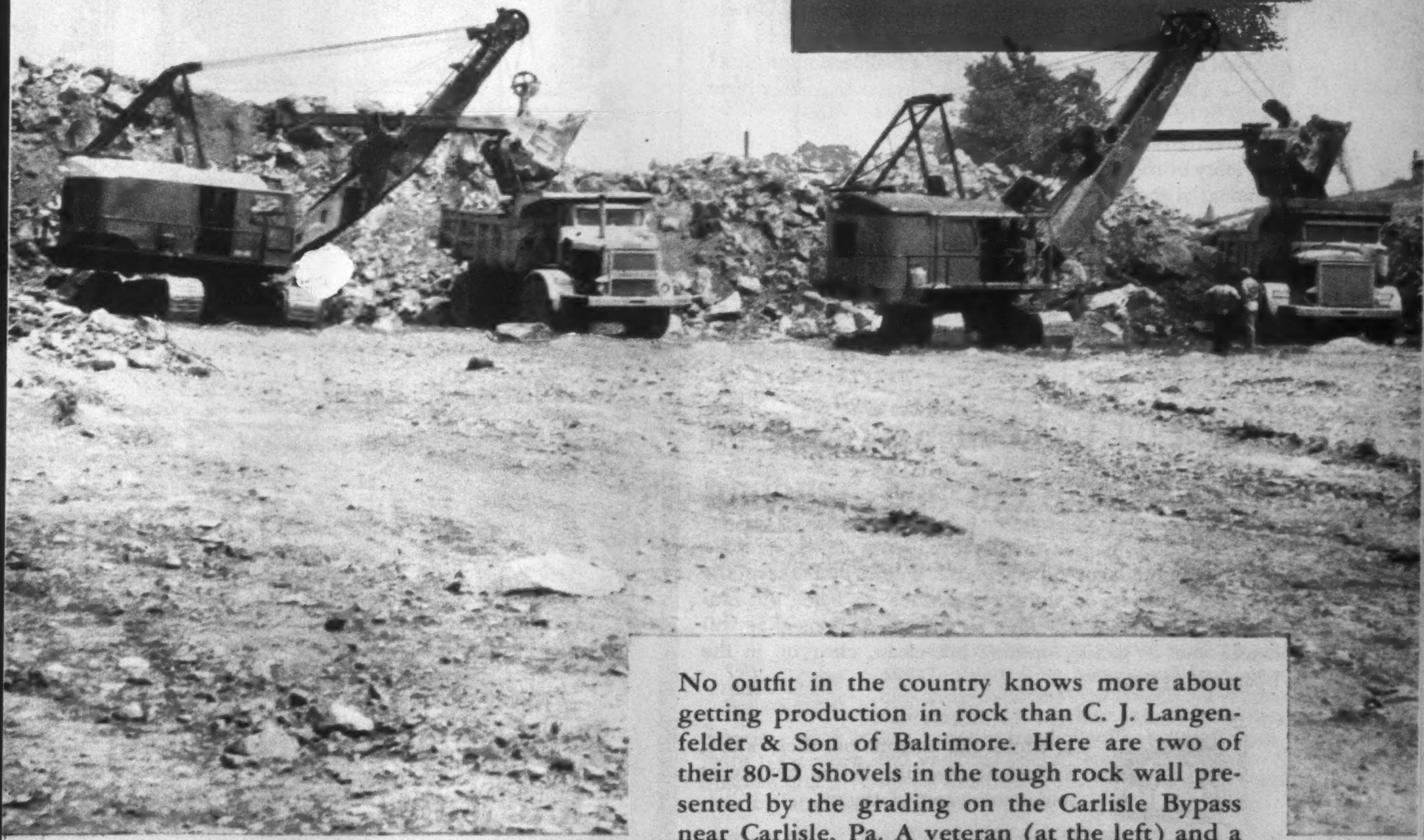
Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Printed at Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. **Executive, Editorial, Advertising and Circulation Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator; Daniel F. Crowley, Vice President and Controller. OFFICERS OF THE CORPORATION: Donald C. McGraw, President; Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Executive Vice President and Treasurer; John J. Cooke, Vice President and Secretary. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders. Publisher reserves the right to refuse unqualified subscription.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20 per year, payable in advance. Second-Class mail postage paid at Albany, N. Y. Printed in U.S.A. Title® registered in U.S. Patent Office. ©Copyright 1961 by McGraw-Hill Publishing Co., Inc. All rights Reserved. **UNCONDITIONAL GUARANTEE:** Our primary aim is to provide subscribers with a useful and valuable publication. Your comments and suggestions for improvements are encouraged and will be most welcome. The publisher, upon written request, agrees to refund the part of the subscription price applying to the remaining unfilled portion of the subscription—if editorial service is unsatisfactory.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Fulfillment Manager, ENGINEERING NEWS-RECORD, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify, publisher *promptly of any change of address, giving old as well as new address, and including postal zone number,* if any. If possible enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

Postmaster: Please send Form 3579 to Fulfillment Manager, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

28 NORTHWESTS

for C. J. LANGENFELDER & SON BALTIMORE, MARYLAND!



UNPOSED PHOTOGRAPH OF NORTHWESTS DOING A JOB

No outfit in the country knows more about getting production in rock than C. J. Langenfelder & Son of Baltimore. Here are two of their 80-D Shovels in the tough rock wall presented by the grading on the Carlisle Bypass near Carlisle, Pa. A veteran (at the left) and a new 80-D are pushing the drillers and taking out 1700 to 1800 cu. yds. of shot rock a day.

C. J. Langenfelder & Son bought their first Northwest 16 years ago. They have recently put their 28th Northwest to work! That's an average of 1¾ Northwests a year.

If you are planning to add shovel or crane equipment for your future work, you can't find a better guarantee of the kind of service you want than this. One out of every three Northwests sold is a repeat order. There is no better investment for getting the job done!

NORTHWEST

CRANES • SHOVELS • DRAGLINES
PULLSHOVELS • TRUCK CRANES

3/4 to 3 Cu. Yd. Capacity

NORTHWEST ENGINEERING COMPANY
1502 Field Bldg., 135 S. La Salle Street • Chicago 3, Illinois

LUBE LOGIC

New tips for

Don't let storage tank contaminate gasoline

One of the basic essentials of good equipment performance is clean fuel; and the best way to make sure the fuel you use is as clean as the fuel you buy is to keep your own storage facilities up to snuff.

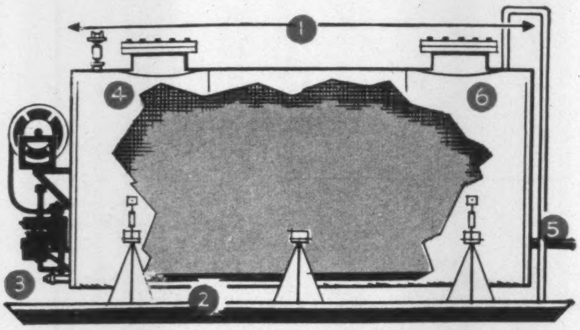
What does it take to make the ideal gasoline storage tank? Here are some of the specifics that Texaco engineers have found to be most important.

The ideal gasoline storage tank has:

1. Plenty of room. Every time you fill a tank you stir up the sediment at the bottom. The bigger the tank, the less it has to be refilled, and the longer the sediment stays settled on the bottom.

2. Welded construction.

3. A 1½″ drain valve, located at the lowest point.



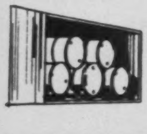
4. A large hand hole plate or manhole, to make cleaning easier.

5. A suction line to the gasoline pump located several inches above the tank bottom, to avoid drawing out the sediment and condensate.

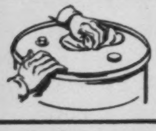
6. A fine-mesh strainer over the filler opening.

Four tips to keep hydraulic oil clean in storage and handling

Even the best maintenance techniques won't keep your hydraulic equipment on the move if you don't keep the oil clean while it's in storage and while it's being put into the machine. Here are four simple precautions that will assure you of getting nothing but clean, clear oil in the hydraulic system:



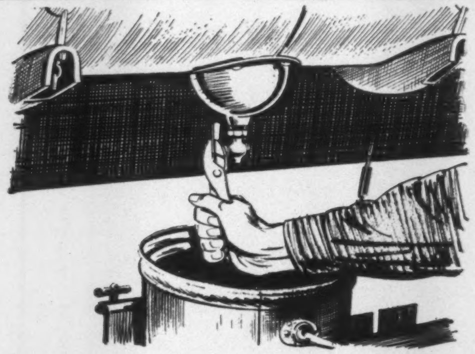
1. Store the drums on their sides, indoors if possible, but in any event under some sort of shelter.



2. Before you open a drum, clean the top so that no dirt or water can fall into the oil.

3. Make sure that you use only *clean* hose and containers in transferring the oil from the drum to the equipment.

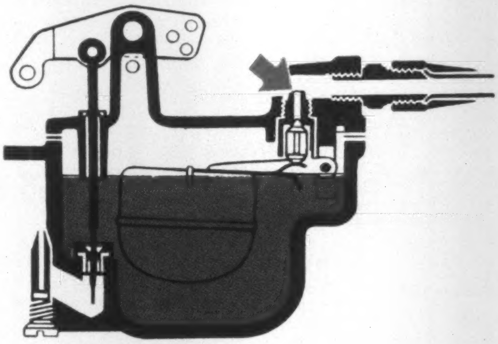
4. Filter the oil as it enters the reservoir on the machine. If the fill pipe on the equipment doesn't have a filter, use a funnel fitted with a 200-mesh screen.



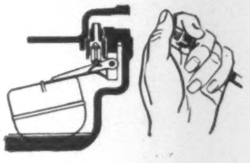
Protect diesel fuel injector with periodic tank drains

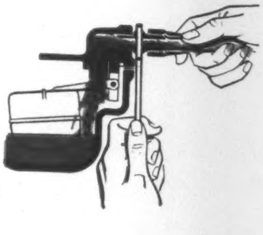
Dirt and water in diesel fuel can ruin a fuel injector in no time. Even if you keep the fuel clean during storage, there's still a good chance that temperature changes will create enough condensation in the fuel tank on your rig to start rusting in the injectors. Several operators have pretty well solved this problem by partially draining the fuel tank once or twice a week. Simply draw off about a gallon of fluid through the drain valve at the bottom of the fuel tank. You lose some fuel this way, but you also get the accumulated water and other contaminants clear out of the fuel system. The cost of the fuel you drain off is a small loss compared to the repair bills you save on the fuel injectors.

more efficient maintenance



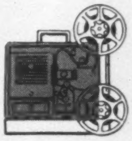
Quick cure for carburetor flooding



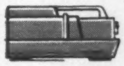


Repeated stalling and hard restarting is often caused by a tiny particle of grit, which lodges under the carburetor float needle valve, lets too much gasoline into the carburetor and causes flooding. You can often solve the problem with the following routine: disconnect the fuel line at the carburetor and plug it with a cork, a pencil or anything else that will fit. Then run the engine until you've used up all the fuel in the carburetor. Reconnect the fuel line, crank the engine, and the rush of gasoline into the empty carburetor will often flush the foreign matter out of the needle valve seat. If you have a friend but no cork, have the friend start the engine while you plug the disconnected line with your thumb. Same difference.

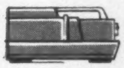
TEXACO PRESENTS
THREE NEW FILMS
TO HELP BOOST
YOUR PROFITS



1. PLAN FOR PROFIT—Texaco's newest color-and-sound movie. Dramatizes the major savings you can make with the proper investment of less than 1% of your total budget—the amount you spend on lubricants. Film features latest lubrication methods and equipment on a number of contracting projects, demonstrating the Texaco Simplified Lubrication Plan in action.



2. FUNDAMENTALS OF LUBRICATION—a brand new Texaco color slide film. A clear, concise once-over that defines technical terms like "viscosity" and explains specifically what lubrication is and what it does. This down-to-earth discussion will give the lubrication man a new understanding of the importance of lubrication, and a fresh interest in his work. It's supplemented with a manual that covers the same ground in greater detail.



3. LUBRICATION OF EARTHMOVING EQUIPMENT—a new slide film, in color. A concise, easy-to-understand analysis of proper lubrication of engines, wheel bearings, steering, track rollers, crawler treads, hydraulic equipment, wire rope, open and enclosed gears. Supplemented with a manual that covers the whole field of earthmoving equipment lubrication in greater detail.

FOR AN EARLY SHOWING of any one of these films—or all of them—contact your Texaco Contractor Representative *now*.

TEXACO LUBRICATION ENGINEERS

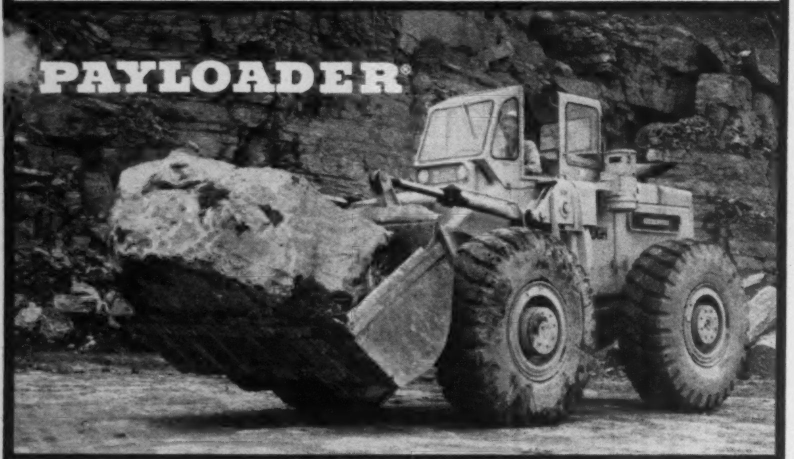
Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in money and time can be made. If Lube Logic doesn't solve your problem, call your local Texaco Lubrication Engineer. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

TEXACO

Throughout the United States
Canada • Latin America • West Africa

Model H-90B...doubles



load-out production

Operator says, "We've been PAYLOADER users for ten years and have 10 now. The H-90B nearly doubles load-out production over the regular H-90. This is made possible by the additional engine power, faster all-around digging and no lazy periods in the loading cycle. The air brakes are much easier on the operator and the larger tires give better load-carry stability."

Owner says, "Our old H-90 showed a longer trouble-free life under steady, tough work conditions than other equipment. Our new H-90B is even heavier constructed for hard use, and with its bigger engine, plus a lot of work-increasing features, should help cut our costs to record low levels."

Operator says, "It's a pleasure to run this compared to the .... we have. Best front-end loader I have been on and I've been running loaders, dozers and cranes since 1936. It operates much easier — a wonderful machine."

Owner says, "This is the third PAYLOADER we've owned and we think it is one of the best front-end loaders made. It works fast in loading, which is essential in our work. It's very dependable — and it has to be to keep our fleet of trucks busy. We can't afford downtime."

Your Hough Distributor says, "Watch the H-90B work, or drive it yourself, and find out how stable, easy-operating and productive it is." It makes the most complete use of air and oil filters and seals to keep out dust and dirt and insure dependable, low maintenance performance; makes fullest use of power-assists and other features for safe, easy operation. It is available with 2¼ to 5 yd. buckets — also "Drott 4-in-1" bucket and other useful allied equipment.

HOUGH®
THE FRANK G. HOUGH CO.
772 Sunnyside Ave.
Libertyville, Ill.
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

Send complete data on H-90B
PAYLOADER and all Allied Equipment

Name
Title
Company
Street
City State
7-B-2

Reader Comment

Keep the Core Cool

SIR—The article "Grouters Go Deep At Denver's Dillon Dam" (ENR May 18, p. 66) was very interesting to us as we have just filed an application with the FPC for a preliminary permit to study a project in Alaska that includes construction of an earthfill dam 130 ft high and 1,400 ft long. Foundation conditions are similar to those at Dillon Dam.

Our proposed project would not be feasible using conventional methods such as described in this article for obtaining an impervious core and foundation seal.

We are proposing to drive 4-in. dia pipe through the previous foundation material into bedrock and extend these pipes to the surface of the dam as the fill is placed. Each winter, during construction and after the dam is completed, whenever the air temperature is 20F or colder, a brine or antifreeze solution would be circulated down these pipes to freeze a zone at least 30 ft thick thereby eliminating the need for core material, cutoff trench and grout curtain.

Letting nature provide the cooling, we estimate the actual operating cost for the freezing process should not be more than $5,000 a year for a maximum of five years. After initial freezing, we anticipate that additional freezing will only be required for a few days each winter, if at all.

Incidentally, we propose to use compacted gravel for the entire dam since it is readily available and is easier to freeze than most materials. I realize that we have the advantage of longer winters and colder ground (one abutment is already frozen permafrost). Certain conditions may justify consideration of permanent frozen cores for dams in "the lower forty-nine."

ARNOLD J. HANSON
President
Chatanika Power Co., Inc.
Fairbanks, Alaska

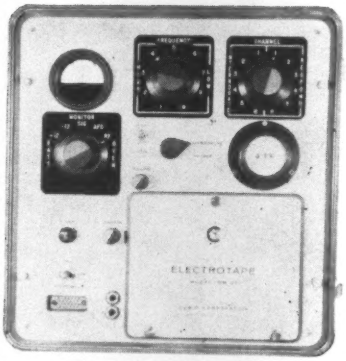
Clarity on the Colorado

SIR—You made the flat statement that our proposals "clouded the already muddy Colorado River power picture" (ENR July 13, p. 17). In the interests of accuracy, I am writing to explain how the suggestions of the Los Angeles

(Reader Comment Continued p. 10)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Cubic DM-20 Electrotape system quickly pinpoints location of off-shore installation.



ELECTROTAPE WORKS WHERE CHAIN AND TAPE WON'T: The new, lightweight, all-transistorized version of Cubic Electrotape, Model DM-20, marks a major breakthrough in the art of surveying. Electrotape eliminates time-consuming chain and tape work, and lets even unskilled operators measure distances from 150 feet to 40 miles in just a few minutes per set-up. Easily operable by one man, the DM-20 weighs only 25 pounds. Its accuracy is 1 centimeter plus 3 parts per million, and the front panel readout is directly in centimeters, eliminating scope or meter interpretations. The DM-20 operates day and night, in any weather, with a built-in radio-telephone permitting communication between operators at all times. A single tripod-mounted unit incorporates the recessed parabolic antenna, regulated power supply, compact battery, and electronic circuits. **Write for** descriptive literature to Dept. ENR-105, Industrial Division, Cubic Corporation, San Diego 11, California.

C cubic
CORPORATION
INDUSTRIAL DIVISION
SAN DIEGO 11, CALIFORNIA

15 ways to save

The king of the long span is also the economy ace in short span bridge construction, particularly in view of recent developments involving design, materials, and methods. A new grade of steel, new steel sections, new design ideas, broader applications of tried and true auxiliary details—in all, a total of 15 opportunities for a bridge designer to reduce the cost of a structure, to build more bridges within his budget, without the least sacrifice in quality.

Design your next short span project in steel, applying these recent developments to the optimum. You'll be pleasantly surprised at the cost.

Write for our free booklet, "36 Ideas for Tomorrow's Short-Span Bridges."

USS is a registered trademark

1. Specify new ASTM-A36 steel instead of ASTM-A7 for main structural supports in spans of 20' and longer. ASTM-A36 offers 10% more allowable stress, so it cuts weight about 6%, cuts costs from 3%-5%.

2. Replace conventional ASTM-A373 with ASTM-A36 for better weldability and save $2-$6 a ton.

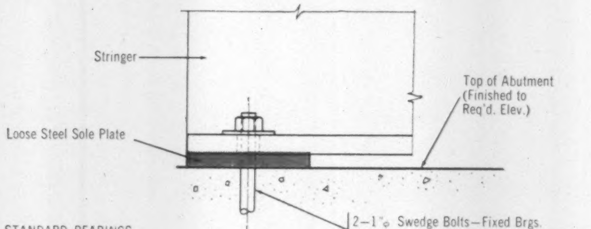
3. Where the new lightweight wide flange sections can be used in place of former minimum sections, weight reduction of about 10% can be achieved in beam spans.

4. Use all-welded construction to simplify detail, reduce weight and cut fabrication cost through the elimination of riveted or bolted attachment of stiffeners, diaphragms and shop splice material.

5. Design for composite beam and slab action in spans over 50' to reduce weight and cost. The shallower floors provide greater underpass clearance, lessen approach embankment costs and reduce structural steel weight as much as 30%.

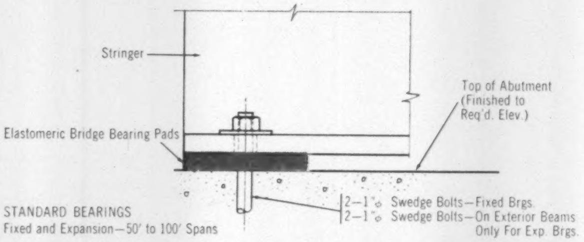
6. Replace long series of heavy simple spans with more efficient continuous spans and save 15%-30% and more in weight. Use the AISC publication, "Moments, Shears and Reactions, Continuous Highway Bridge Tables" (AIA File No. 13-C) to save design time.

7. Simple steel shoes for spans up to 50'. For low bearing pressures where deflection is not a problem, use simple steel plate for both sole and masonry plate at both fixed and expansion ends on spans up to 50'.


Stringer
Top of Abutment (Finished to Req'd. Elev.)
Loose Steel Sole Plate
2—1"⌀ Swedge Bolts—Fixed Brgs.
2—1"⌀ Swedge Bolts—On Exterior Beams Only For Exp. Brgs.

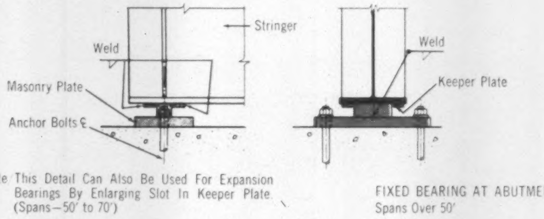
STANDARD BEARINGS
Fixed and Expansion—to 50' Spans

8. Simple elastomeric shoes for spans up to 100'. Specify elastomeric pads for bridge shoes on spans up to 100' to cut costs considerably.


Stringer
Top of Abutment (Finished to Req'd. Elev.)
Elastomeric Bridge Bearing Pads
2—1"⌀ Swedge Bolts—Fixed Brgs.
2—1"⌀ Swedge Bolts—On Exterior Beams Only For Exp. Brgs.

STANDARD BEARINGS
Fixed and Expansion—50' to 100' Spans

9. Fixed bearing plates for spans over 50'. Use fixed bearings with a combination masonry plate and rocker for spans of 50' to 100' where metallic shoes are preferred and deflection is a problem. A wide slot in the keeper plate will provide an adequate expansion bearing for spans of 50' to 70'.


Stringer
Weld
Masonry Plate
Anchor Bolts ℄
Weld
Keeper Plate

Note This Detail Can Also Be Used For Expansion Bearings By Enlarging Slot In Keeper Plate. (Spans—50' to 70')

FIXED BEARING AT ABUTMENT
Spans Over 50'

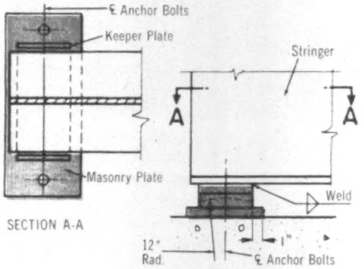
General Offices: 525 William Penn Place, Pittsburgh, Pa. Contracting Offices in: Ambridge · Atlanta · Baltimore · Birmingham · Boston · Chicago · Cincinnati · Cleveland · Dallas · Denver · Detroit · Elmira · Gary · Harrisburg, Pa. · Houston · Los Angeles · Memphis · Minneapolis · New York · Orange, Texas · Philadelphia · Pittsburgh · Portland, Ore. · Roanoke · St. Louis · San Francisco · Trenton · United States Steel Export Company, New York

American Bridge
Division of
United States Steel

USS

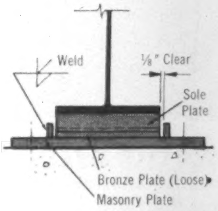
money on short span bridges

10. Sliding bronze expansion plates for spans over 70′. Specify bronze sliding rocker plates for economical expansion bearings on spans over 70′. Keeper bars need be placed only at the sides to prevent lateral movement.



℄ Anchor Bolts
Keeper Plate
Masonry Plate
Stringer
A
A
Weld
12″ Rad.
1″
℄ Anchor Bolts

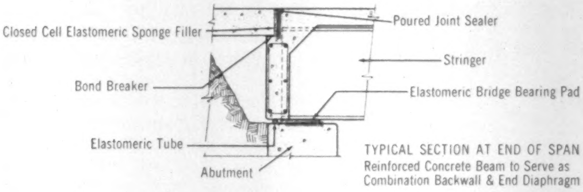
SECTION A-A



Weld
⅛″ Clear
Sole Plate
Bronze Plate (Loose)
Masonry Plate

EXPANSION BEARINGS
Spans Over 70′

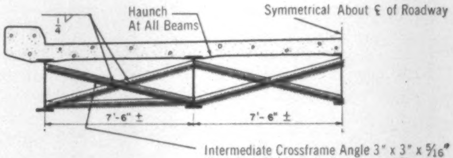
11. Eliminate structural diaphragms and backwalls at abutments. Use concrete diaphragms to provide support for approach slabs, and to replace conventional abutment backwall. Closed cell elastomeric sponge filler and point joint sealer replace costly expansion dams.



Closed Cell Elastomeric Sponge Filler
Poured Joint Sealer
Stringer
Bond Breaker
Elastomeric Bridge Bearing Pad
Elastomeric Tube
Abutment

TYPICAL SECTION AT END OF SPAN
Reinforced Concrete Beam to Serve as Combination Backwall & End Diaphragm

12. Welded angle diaphragms lead to simplification. Use panels welded directly to the webs of stringers for simple transverse bracing. Note the absence of top struts and use of a bottom strut only in outer panel.

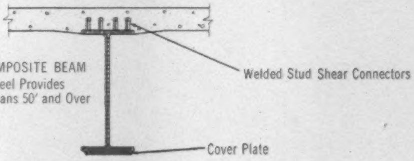


Haunch At All Beams
Symmetrical About ℄ of Roadway
7′-6″ ±
7′-6″ ±

Intermediate Crossframe Angle 3″ x 3″ x 5/16″ Weld Both Sides of Vertical Leg and Top Side of Horizontal Leg to Beam with ¼″ Continuous Fillet Weld. Horizontal Angle Offset to Clear Diagonal Angles By 2″.

HALF TRANSVERSE SECTION
Welded Angle Diaphragms

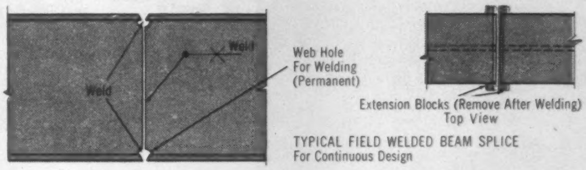
13. Welded stud shear connectors simplify fabrication. Use welded stud type shear connectors for composite design to facilitate shop and field assembly. Keep studs to a minimum, by using largest size studs.



Welded Stud Shear Connectors
Cover Plate

TYPICAL SECTION THRU COMPOSITE BEAM
Composite Design Using A36 Steel Provides Most Economical Section for Spans 50′ and Over

14. Use welded field splices to cut costs. Use welded field splices for fabrication and erection economy when all other field connections are welded as suggested under item 4.

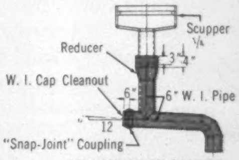


Weld
Weld
Web Hole For Welding (Permanent)
Extension Blocks (Remove After Welding)

Top View

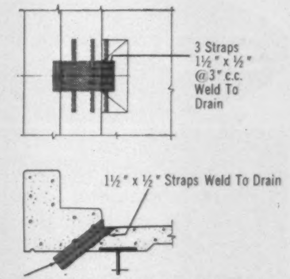
TYPICAL FIELD WELDED BEAM SPLICE
For Continuous Design

15. Welded drainage details simplify design and eliminate expensive castings. Use combination scuppers and conduits for drains not requiring connection to sewers. Use wrought iron pipe with corrosion-resistant weldments for scuppers for larger drains connected to sewers. Note the use of "snap-joint" couplings for easy removal for cleaning.



Scupper
¼
Reducer
3″
4″
W. I. Cap Cleanout
6″
6″ W. I. Pipe
12
"Snap-Joint" Coupling

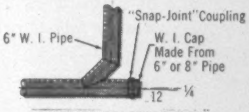
CONNECTION AT SCUPPER



3 Straps 1½″ x ½″ @ 3″ c.c. Weld To Drain
1½″ x ½″ Straps Weld To Drain

2–12 ⊏30—Weld to Form Drain and Galvanize After Welding. (Or Fabricate From ½″ Wrought Iron or Eq.)

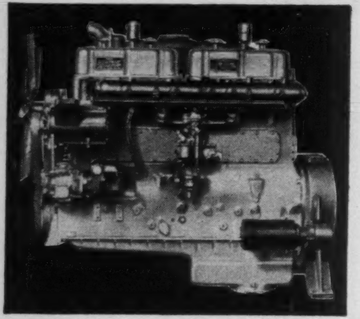
SCUPPER DETAIL



"Snap-Joint" Coupling
6″ W. I. Pipe
W. I. Cap Made From 6″ or 8″ Pipe
12
¼

UNDERGROUND CONNECTION
DRAIN PIPE DETAIL

This mark tells you a product is made of modern, dependable Steel.



15,000 MILES AN HOUR
But first...
WAUKESHA
power

Crane-Truck Engine—Waukesha 145-GZ (gasoline), six cylinders, 5⅜-in. x 6-in., 817 cu. in. displ.

Travel speed—more than 15,000 miles an hour for 6,000 miles plus. Instantly launched from underground silos, Minuteman missiles are awesome defensive weapons. But construction comes first. Building this Minuteman missile complex in central Montana—a $62-million contract, and a two-year job—is under way. *Waukeshas are at work*—powering the several P&H model 565 truck cranes. They're building 15 launch control centers; and 150 hardened underground missile silos, 84 ft. deep with 12 ft. bottom diameter. Shown is one of these cranes with 40 ft. booms and 1¼-yd. clam buckets, excavating shot rock from the silos. Silos are usually excavated to a 50-ft. depth below cranes' working level. Because of size and looseness of shot rock, excavation rates vary. One crane handled six 10-yd. truck loads an hour. That shows the *dependability* of Waukesha power. Each crane has two gasoline Waukeshas: a 140-GZ powers the boom; a 145-GZ the truck. Other models for cranes or shovels, up to 1200 hp, Diesel or gasoline. Send for descriptive bulletins.

521-R

WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN
NEW YORK TULSA HUNTINGTON PARK, CALIF.
Factories: Waukesha, Wisconsin; Clinton, Iowa; Houston, Texas

Department of Water and Power would lead to the most economic and maximum utilization of the power resources of the Colorado River.

Our program consists of two major features:

1. On February 1, 1960, we filed an application with the Federal Power Commission for license to construct a dam and power plant at Bridge Canyon. Arizona has a competing application before the FPC. We also have indicated our interest in and support for an alternative proposal advanced in Congress whereby Arizona, California and Nevada power agencies jointly would advance funds to the federal government for construction of the Bridge Canyon project by the U. S. Reclamation Bureau.

2. On June 21, 1961, the Department of Water and Power filed testimony and exhibits with the FPC for a combination Marble Canyon-Kanab Creek power development. Arizona has pending before FPC an application for a Marble Canyon project. Under our suggestion, the combined development would be shared by Arizona, California and Nevada and would give Arizona a larger power allotment than it would receive from its proposed single project. We urged full federal investigation of this plan.

The program proposed by the Department of Water and Power would result in maximum economic utilization of the flow of the Colorado River and would be paid for by revenues from sale of power without any subsidy from U. S. taxpayers. It would result in the generation of more than 10 billion kwh of electric energy annually, with a saving of approximately 17 million barrels of oil annually in equivalent steam power generation. It would enable three states to participate in a maximum power pool rather than allow a single state to monopolize a small power pond.

I hope these facts will clear up any misapprehensions your readers may have reached through your reference to the Colorado River power picture being "cloudy."

Samuel B. Nelson
General Manager and Chief Engineer
Department of Water and Power
Los Angeles, Calif.

Try the Distaff Side

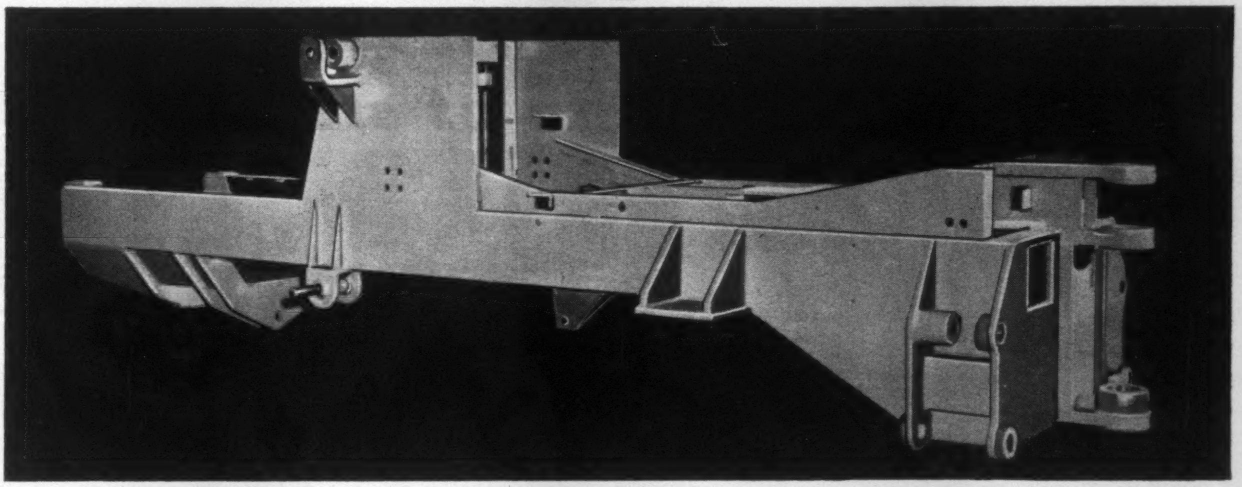
Sir—"Apprentices Are Hard to Get" (ENR June 15, p. 81) states that "Young men . . . aren't what they used to be . . . and they think they are entitled to big money even though they have no training for anything."

Why doesn't the BTEA try training young women? They proved good WACS, WAVES, etc., and women now work in jobs formerly considered a masculine prerogative. In fact, women engage in construction work all over the world.

Aloysius Schuszler
The H. K. Ferguson Co.
Cleveland, Ohio

Wherever stress and strain are toughest

"DYNAHOE" IS STRONGEST



Great strength is centered in this massive Foundation Frame

Learn the full meaning of *completely integrated machine construction.*

Learn what *complete, balanced integration* of loader, tractor and backhoe can mean on *your* job in terms of greater machine output, more versatile job utility, decreased maintenance, eliminated downtime, and longer machine life.

See the "DYNAHOE." Compare it part for part with any other combination of tools now being used for Backhoeing, Backfilling and Loading operations. Examine the individual integrated components. Note the BALANCE between loader and backhoe and the BALANCE of weight over both axles. Note the BALANCE in construction which provides greater "keep going strength," gives greater power and all-day efficiency, and gives endurance where digging conditions are toughest.

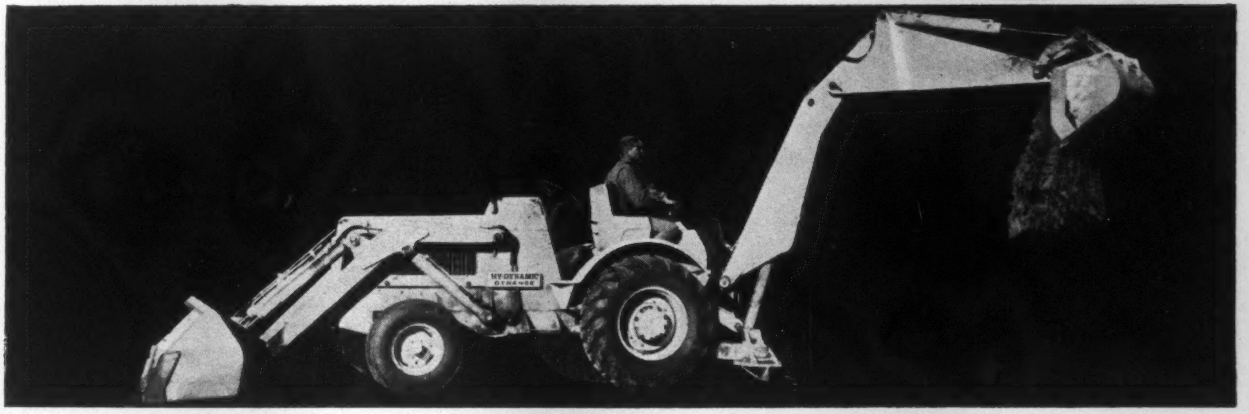
See how all stress and strain is transmitted throughout the entire machine by the massive foundation frame. This frame puts the WHOLE MACHINE behind every digging and loading action! There are no weak, brittle spots for breakdown in the "DYNAHOE."

Be sure to note the OVERSIZE PINS used throughout . . . the special heat exchanger for Backhoe, Loader and Torque Converter which assures ALL DAY WORK EFFICIENCY. Note the 75 H.P., 6 cylinder engine . . . the torque converter . . . the power shift transmission . . . the heavy duty planetary rear axle. "DYNAHOE" is available in gasoline and diesel models.

For full information on "DYNAHOE" or for the name of your nearest Distributor, write:

THE HY-DYNAMIC CO.
419 Skokie Highway, Lake Bluff, Illinois
CEdar, 4-5400

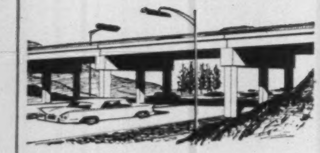
DYNAHOE

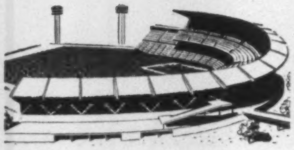


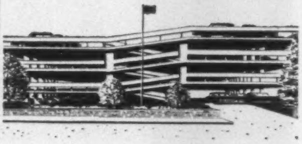
PRESTRESSED CONCRETE

delivers important advantages to a wide variety of structures

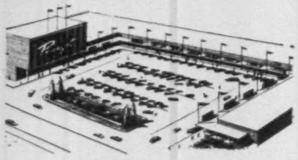
Office Buildings

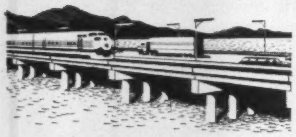

Overpasses

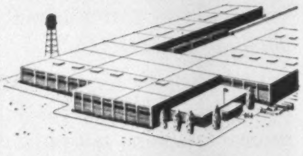

Stadiums


Parking Structures

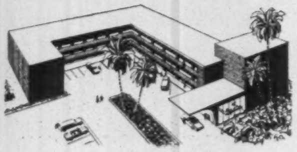
Schools


Shopping Centers

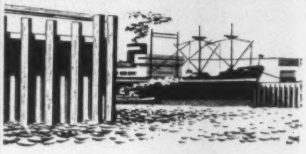

Bridges—Rail and Highway


Industrial Plants and Warehouses

Churches


Apartments and Motels

Public Buildings


Marine Structures

In every section of the country architects and engineers are finding, in precast prestressed concrete units, a *flexible, easy to use* construction method for *nearly all types of structures.* Plant-manufactured precast prestressed concrete girders, beams, columns, wall panels, floor and roof units and piling meet *fast construction schedules*—provide *superior structures for less money.*

PRESTRESSED CONCRETE

combines two basic materials to give you the best of both

For plant-produced, quality controlled prestressed concrete, consult the PCI Active Member nearest you:

ARIZONA Arizona Prestressed Concrete Co., Phoenix • United Materials Inc., Phoenix

CALIFORNIA Basalt Rock Co., Napa • Ben C. Gerwick, Inc., San Francisco • Concrete Conduit Company, Div. American-Marietta Company, Colton • Delta Prestressed Concrete, Inc., Florin • Rockwin Prestressed Concrete, Santa Fe Springs • San Diego Prestressed Concrete, San Diego • Wailes Precast Concrete Corp., Sun Valley

COLORADO Bullen Concrete Products, Pueblo • Prestressed Concrete of Colorado, Denver • Rocky Mountain Prestress, Englewood

CONNECTICUT C. W. Blakeslee & Sons, New Haven

FLORIDA Capitol Prestress Co., Jacksonville • Concrete Structures, Inc., North Miami • Dura-Stress, Inc., Leesburg • Duval Engineering & Contracting Co., Jacksonville • Florida Prestressed Concrete Co., Inc., Tampa • Juno Prestressors, Inc., West Palm Beach • Lewis Manufacturing Co., Inc., Miami • Maule Industries, Inc., Miami • Meekins-Bamman Precast Corp., Hallandale • Prestressed Concrete, Inc., Lakeland • Southern Prestressed Concrete, Pensacola • West Coast Shell Corp., Sarasota • R. H. Wright, Inc., Fort Lauderdale

GEORGIA American-Marietta Company, College Park • Leap Structural Concrete, Inc., Powder Springs • Macon Prestressed Concrete Co., Macon

HAWAII Concrete Engineering Co., Honolulu

IDAHO Gemstone Prestress Co., Idaho Falls • Idaho Concrete Pipe Co., Nampa • Ready-to-Pour Concrete Co., Idaho Falls

ILLINOIS American-Marietta Company, La Grange • American Prestcrete Corp., Plano • Consumers Div., Vulcan Materials Co., Chicago • Crest Concrete Systems, Lemont • Material Service, Chicago • Midwest Prestressed Concrete Co., Springfield • Precast Building Sections, Chicago • Prestressed Concrete Structures, Frankfort

INDIANA American-Marietta Company, Lafayette • Shute Concrete Products, Richmond

IOWA A & M Prestress, Clear Lake • Midwest Concrete Industries, West Des Moines • Prestressed Concrete of Iowa, Iowa Falls • C. W. Shirey Co., Waterloo

KANSAS Russell Ralph Co., Topeka • Sunflower Prestress, Inc., Salina • United Prestress Co., Wichita

LOUISIANA Belden Concrete Products, Inc., Metairie • Prestressed Concrete Products Co., Inc., Mandeville • Mid-State Prestressed Concrete, Inc., Alexandria

MARYLAND Baltimore Concrete Plank Corp., Baltimore

MASSACHUSETTS New England Concrete Pipe Corp., Newton Upper Falls • Northeast Concrete Products, Inc., Plainville • San-Vel Concrete Corp., Littleton

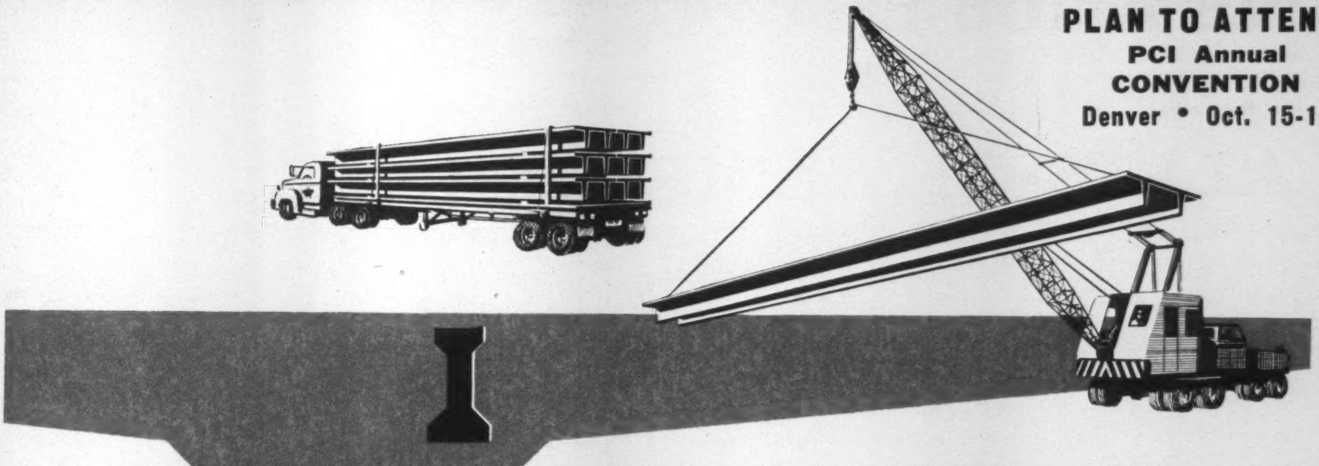
MICHIGAN American Prestressed Concrete Inc., Centerline • Lamar Pipe and Tile Company, Div. American-Marietta Company, Grand Rapids • Precast Industries, Inc., Kalamazoo • Price Brothers, Livonia • Superior Products Co., Detroit

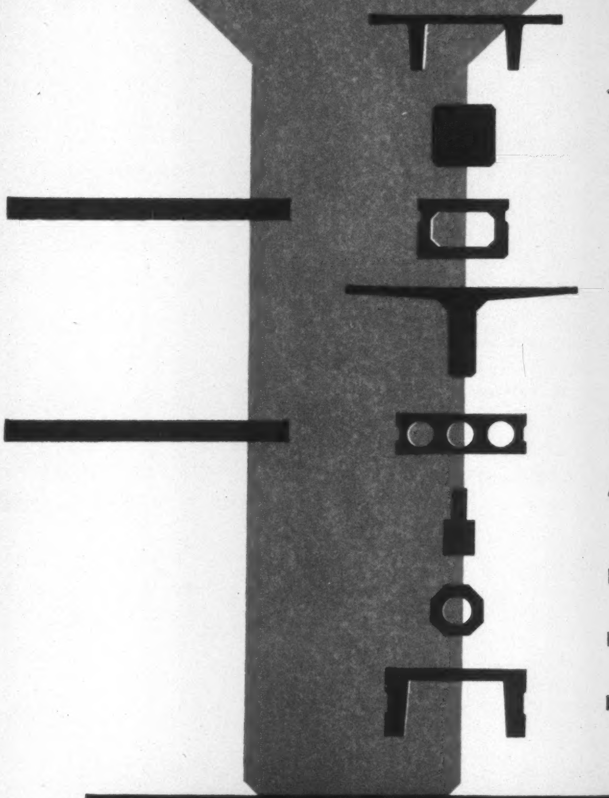
MINNESOTA Cretex Companies, Elk River • Prestressed Concrete Inc., St. Paul • Wells Concrete Products Co., Wells

MISSISSIPPI F-S Prestress, Inc., Hattiesburg • Grenada Concrete Products Co., Grenada • Jackson Ready-Mix Corp., Jackson

MISSOURI Carter-Waters Corp., Kansas City • Missouri Pres-Crete, Inc., Overland • Dexter Ready-Mix Concrete Co., Dexter

PLAN TO ATTEND!
PCI Annual
CONVENTION
Denver • Oct. 15-19





Write for the new, illustrated booklet "PRESTRESSED CONCRETE —Applications and Advantages." This valuable addition to your file illustrates 19 types of projects, how prestressing works, typical products and substantiates these advantages:

LONG SPANS, SHALLOW DEPTHS... for fewer columns, more *usable* floor space. High strength produced by prestressing allows the design of well proportioned building members of limited depth for given spans.

CUTS CONSTRUCTION TIME — Plant manufacture of prestressed members and site work proceed simultaneously to shorten job schedule.

FINISHED PRODUCT OF PLANT CONTROLLED QUALITY — A wide range of architectural and structural shapes meeting PCI and AASHO requirements are available at local plants.

FIRE RESISTANT — Tests have proven the high fire resistant quality of prestressed concrete.

ATTRACTIVE APPEARANCE — FLEXIBLE IN DESIGN — Can take a variety of aesthetically agreeable shapes and bold new designs. Refined prestressed designs result in lighter weight structures.

LOW INSURANCE COST — Durability and fire resistance earns low insurance premiums.

MAINTENANCE-FREE — Requires no painting, little or no waterproofing. Needs no protection from corrosion and is virtually crack-free.

LOW INITIAL COST — Design flexibility, quality plant production and short construction time mean superior structures for less money.

PRESTRESSED CONCRETE INSTITUTE

PRESTRESSED CONCRETE INSTITUTE
205 WEST WACKER DRIVE • CHICAGO 6, ILLINOIS

Gentlemen: Please send me your free booklet "Prestressed Concrete—Applications and Advantages."

NAME____________________

NS-17

POSITION____________________

FIRM____________________

ADDRESS____________________

CITY____________________ ZONE______ STATE____________

MONTANA Floyd Pappin & Son, Inc., Great Falls

NEBRASKA Nebraska Prestressed Concrete Co., Lincoln • Wilson Concrete Co., Omaha

NEW JERSEY Camco Concrete Corp., Vineland • Formigli Corp., Berlin

NEW MEXICO American-Marietta Company, Albuquerque

NEW YORK American-Marietta Company, New York City • American-Marietta Company, Syracuse • Precrete, Inc., Corona • Principe-Danna, Inc., Long Island City • Raymond International, Inc., New York • Winkrete Precast Co., Inc., Syracuse

NORTH CAROLINA Arnold Stone Co., Greensboro • Concrete Materials, Inc., Charlotte • North Carolina Products Corp., Raleigh • Piedmont Construction Co., Winston-Salem • S & G Prestress Co., Wilmington

OHIO American-Marietta Company, Columbus • Concrete Masonry Corp., Elyria • Concrete Pipe Co. of Ohio, Cleveland • Marietta Concrete, Div. American-Marietta Company, Marietta

OKLAHOMA Oakley Engineering Co., Tulsa

OREGON Builders Supply Co., Medford • Empire Pre-Stress Concrete of Oregon, Portland • Ross Island Sand & Gravel, Portland

PENNSYLVANIA American-Marietta Company, Norristown • Dickerson Structural Concrete Corp., Youngwood • Eastern Prestressed Concrete Corp., Line Lexington • New Enterprise Stone & Lime Co., Inc., New Enterprise • Pennsylvania Prestress, Inc., York • Schuylkill Products, Inc., Cressona • Turbotville Block Co., Turbotville

SOUTH CAROLINA American-Marietta Company, Columbia • Ballard-Rice Prestressed Corp., Greenville

SOUTH DAKOTA Gage Bros. Concrete Products, Sioux Falls

TENNESSEE American-Marietta Company, Memphis • Concrete Prestressed Corp., Bristol • Knox Concrete Products, Inc., Knoxville • Nashville Breeko Block Co., Nashville

TEXAS Anchor-Wate Co., Almeda • Atlas Structural Concrete, El Paso • Crowe-Gulde Prestressed Concrete Co., Amarillo • Span, Inc., Dallas • Texas Concrete Co., Victoria • National Precast Corp., Houston • Texas Quarries, Inc., Austin

UTAH Utah Prestressed Concrete Co., Salt Lake City

VIRGINIA Concrete Structures, Inc., Richmond • Shockey Bros., Inc., Winchester • Southern Block & Pipe Corp., Norfolk • Virginia Prestressed Concrete Corp., Roanoke • Alexandria Prestressed, Inc., Alexandria

WASHINGTON Associated Sand & Gravel Co., Everett • Central Pre-Mix Concrete Co., Spokane • Concrete Technology Corp., Tacoma

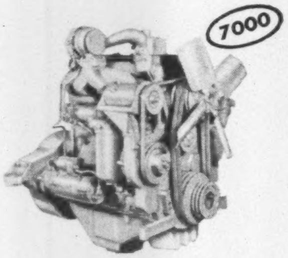
WISCONSIN Concrete Research, Inc., Waukesha • Prestressed Concrete Products Corp., Verona • West Allis Concrete Products Co., Milwaukee • Eau Claire Stresscrete, Inc., Eau Claire • F. Hurlbut Co., Green Bay

PUERTO RICO Pacadar Prestressed Beams Corp., San Juan

CANADA **Alberta**: Con-Force Products Ltd., Calgary • **Manitoba**: Building Products & Coal Co., Ltd., Winnipeg • Supercrete Ltd., St. Boniface • **New Brunswick**: Joseph A. Likely Ltd., St. John • **Newfoundland**: Lundrigan's Concrete Ltd., Corner Brook • **Nova Scotia**: L. E. Shaw Ltd., Halifax • **Ontario**: Murray Associates Ltd., Toronto • Ontario Stress-Crete Ltd., Burlington • Pre-Con Ltd., Brampton • Ryan Builders Supplies Ltd., Windsor • Schell Industries Ltd., Woodstock • Standard Prestressed Structures Ltd., Maple • Toronto Cast Stone Co. Ltd., Toronto • Wilson Concrete Products Ltd., Belleville • J. M. Wright Ltd., North Bay • **Quebec**: Franco Ltd., Montreal • Pressure Pipe Ltd., Montreal

This advertisement sponsored by PCI Active Members

NEW 105-hp 145T JOINS THE ALLIS-CHALMERS MOTOR GRADER LINE



It's BIG . . . it's POWERFUL . . . and built to standards that give you the best performance and work-ability you ever had in a grader this size. A steady worker, the 145T is powered to handle all your blade jobs. Its big-grader features make it an outstanding unit for every contractor bidding for profit or every public body working on a tax dollar.

Check it yourself. The new 145T handles like a dream . . . works like a demon.

New 7000 engine. Proved in other Allis-Chalmers engines, the controlled turbulence, open combustion-chamber design of the turbocharged 7000 gives thorough mixing of air and fuel for complete, fast and even combustion . . . high fuel economy.

Built to answer every demand. A 145T will give you reliable performance on every job. The long-wearing, ceramic-button clutch, heavy-duty transmission and gear train, sturdy main frame and blade controls, are all built with strength in reserve to handle your toughest dirt moving.

More production with this 3-point combination. (1) High-arched axle lets bigger windrows reach the blade. (2) Extra clearance from circle to cutting edge of ROLL-AWAY moldboard allows lively, high-rolling action of material. (3) Engine power that will really lug to get the job done.

It's a pleasure to operate. The flat, clear deck gives a man plenty of room. Exclusive toggle-type controls engage positively without backlash. There's excellent visibility in all directions. Operators work in comfort . . . produce more on every shift.

See the new 145T at your dealer . . . or let him arrange a demonstration. You'll like what you see. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.

STEP
UP
YOUR

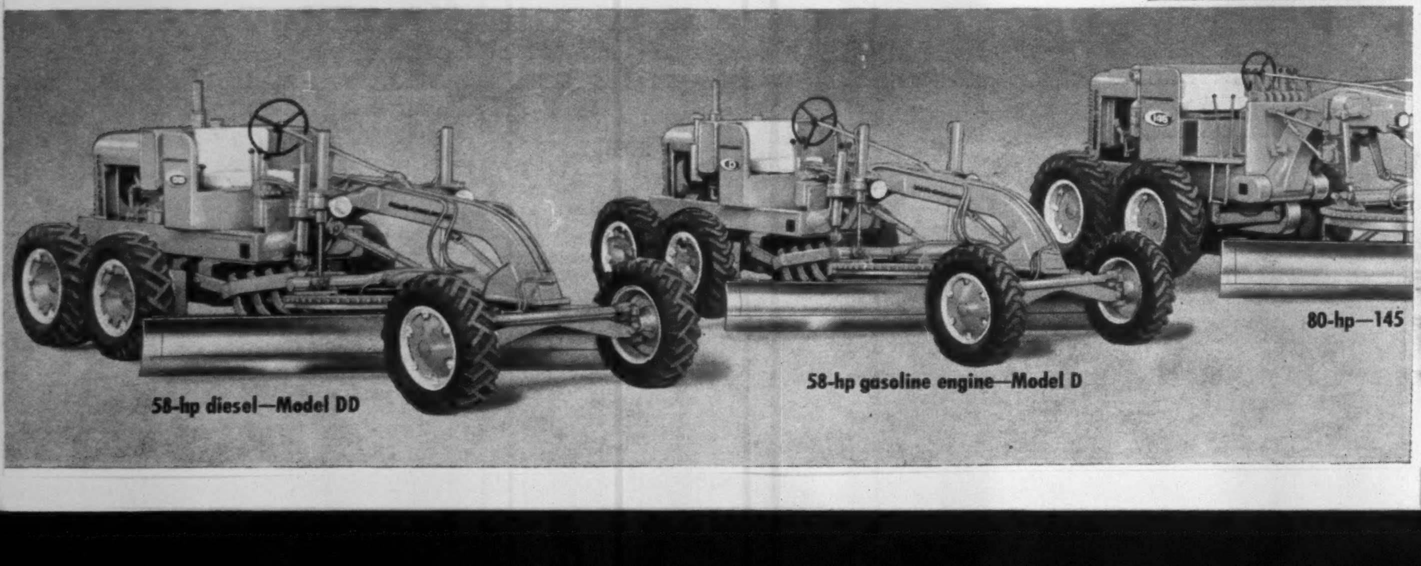
Performance
Operator comfort
Wearability
Ease of maintenance
Reliability

WITH

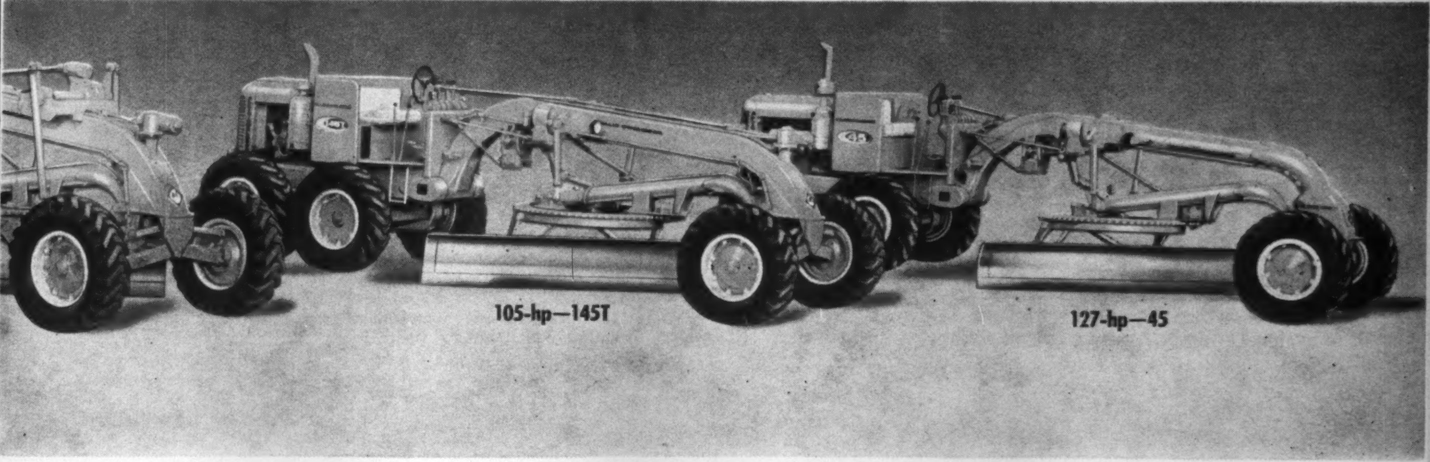
Now available in Allis-Chalmers yellow or Persian Orange at no extra cost.

ROLL-AWAY is an Allis-Chalmers trademark

ALLIS-CHALMERS
POWER FOR A GROWING WORLD



ALLIS-CHALMERS
AC
ALLIS-CHALMERS
145T

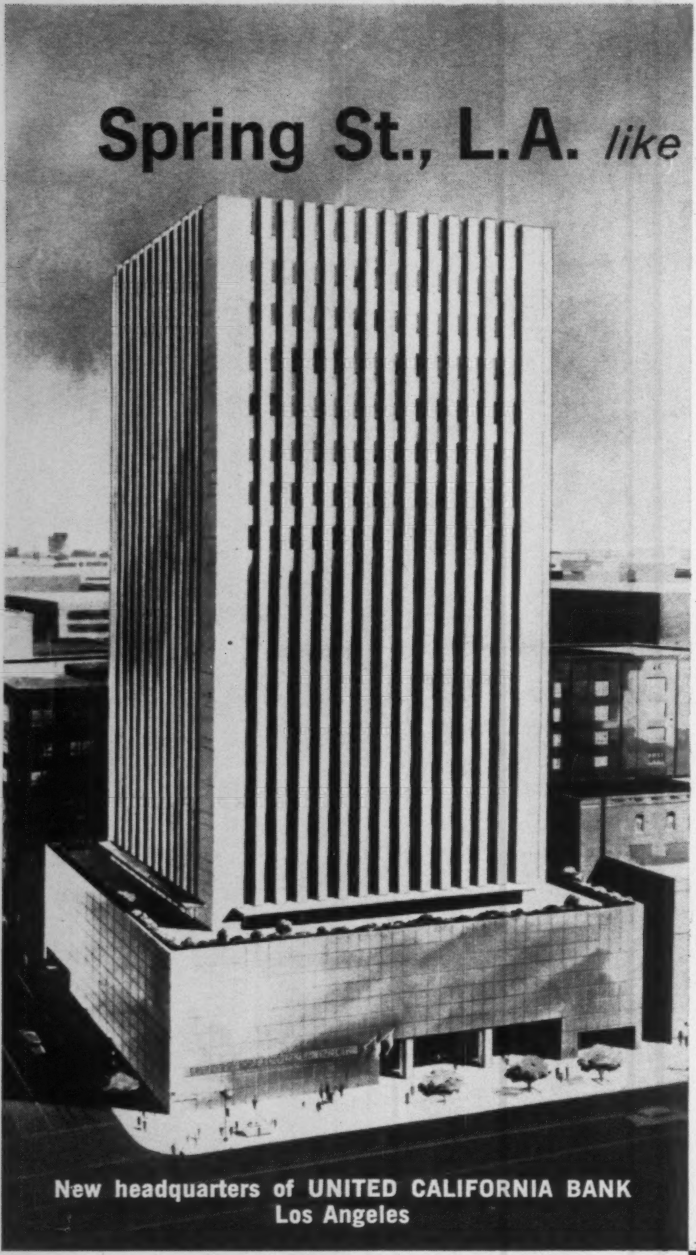


105-hp—145T

127-hp—45

Spring St., L.A. *like* Wall St., N.Y.C.

knows the soundest investment in valves



New headquarters of UNITED CALIFORNIA BANK
Los Angeles

Again, JENKINS VALVES are the bankers' choice

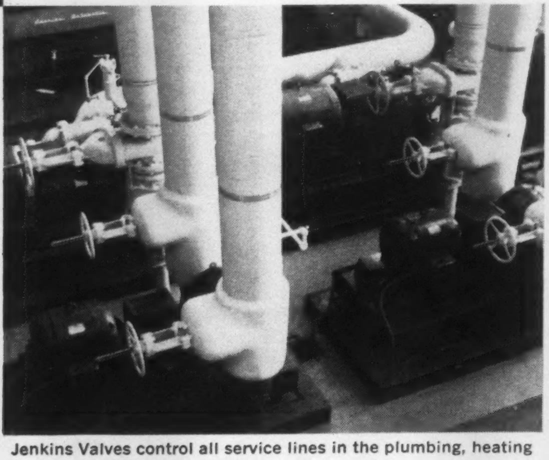
Taller, perhaps, but there's no *finer* bank building in New York than the new Head Office of United California Bank on Spring Street in Los Angeles' financial area. Headquarters for 122 offices in California, this 370,000 sq. ft. building is an outstanding example of the excitingly modern architecture and superb engineering and construction which draws many building experts to Southern California for a "look-see."

There's an expected "California difference" in the design and decor of this bank. But a significant fact is that, like so many of the great bank buildings in New York and other cities, the valves that control the piping systems bear the same *"Diamond and Signature"* trademark.

Obviously, California bankers and their architects and engineers agree with their contemporaries everywhere about the soundest investment in valves. To assure a building-lifetime of trouble-free, economical valve service, they call for JENKINS.

Why should *you* settle for less . . . especially when Jenkins Valves *cost no more* than other good valves? Specify "Jenkins Valves," for almost a century *the standard of quality*. Jenkins Bros., 100 Park Avenue, New York 17, N. Y.

Architect: CLAUD BEELMAN & ASSOCIATES; *Mechanical Engineer:* JOHN C. FREEMAN; *Mechanical Contractor:* MEHRING & HANSON CO.; *General Contractor:* C. L. PECK CONSTRUCTION AND REALTY CO. . . . all of Los Angeles



Jenkins Valves control all service lines in the plumbing, heating and air conditioning system

JENKINS
MOST TRUSTED TRADEMARK IN THE VALVE WORLD
VALVES
JENKINS ®
SINCE 1864
Jenkins Bros

AVAILABLE FROM LEADING DISTRIBUTORS EVERYWHERE

ENGINEERING NEWS-RECORD

Vol. 167, No. 7 August 17, 1961

Number of copies printed in this issue 87,476

CONTENTS

Aid Funds Flow to Latin America 21
Daring Method Builds High Bridge 23
Fewer Big Consultants, A-Es; More Architects ... 24
Road Tunnel Will Pierce Divide 25
Utility Seizure May Speed Work 26
Congress Buys the Shelter Survey 28
Hayes Claims Capehart Ownership 28

FEATURES

Fitting Cities to the Future: Norfolk 32
Epoxies Bond Concrete to Repair New Dams ... 44
Concrete Grillwork Is Load-Bearing Wall 47

INTERNATIONAL

Floors Hung From Roof Trusses 54

NEW PRODUCTS

Compact Plants Treat Sewage 57
Machine Makes Friction Weld 57

MEN AND JOBS

Col. Frye Engineer for South Pacific Division ... 69

BUSINESS AND FINANCE

Fluor Ranks Estimating as Big Business 110
New Zoning Widens City 'Canyons' 111

LABOR

Building Trades Sign Missile Pact 113
Sub Clauses Are 'Protective' 113

Reader Comment ... 6
Washington Observer 19
Obituaries 75
Books 77
Unit Prices 85
Materials Prices 87
Construction Reports. 88
Statistics, Indexes ... 107
Editorials 128

Picture Credits

Cover—Jason Hailey; 23—Bethlehem Steel; 32, 33, 36 top, 39 top, 40 top—Craftsmen, Inc.; 35, 36 bottom, 39 bottom—Haycos Photoramic Inc.; 39 center—Neal V. Clark, Jr.; 44 bottom, 45 bottom—Harold Laney; 46—Rothschild Photo; 47—Gene Daniels; 48—Daniel, Mann, Johnson and Mendenhall.

Back issues of Engineering News-Record *are generally available for the previous six months. Semiannual indexes will be sent on request.* Engineering News-Record *is also indexed in the Applied Science & Technology Index, Business Periodicals Index and the Engineering Index.*

THE CONSTRUCTION WEEK

DEATH DEMANDS ATTENTION—The Air Force assigned a high-ranking ICBM base builder to investigate the construction accident at Lowry Air Force Base, Colo., that killed five workmen (see p. 128). Brig. Gen. Harry Kelley, assistant deputy for Site Activation in Ballistic Systems, heads an examining board. A union official accused the contractors, Morrison-Knudsen and American Machine and Foundry Co., of assigning safety inspection to inexperienced summertime workers. Both of the accused contractors deny this.

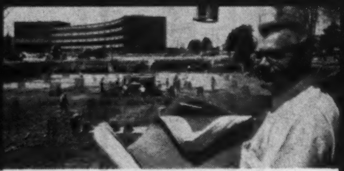
SLOWDOWN IN PAY BOOSTS—Wage increases for union construction workers eased off a little. Second quarter increases averaged 2.6%—lowest in the last four years, says the U.S. Labor Department. This pushed the average hourly scale to $3.81 an hour on July 3, up 4.1%, or 14.7 cents, from a year ago and 85% above the 1947-49 average according to a department spokesman.

FILLING THE GAP—The House Subcommittee on Roads has scheduled hearings this week on a bill that would abolish the office of Commissioner of Public Roads. The job has been vacant since the resignation of Ellis Armstrong last January. The bill would create a new post, that of Deputy Federal Highway Administrator.

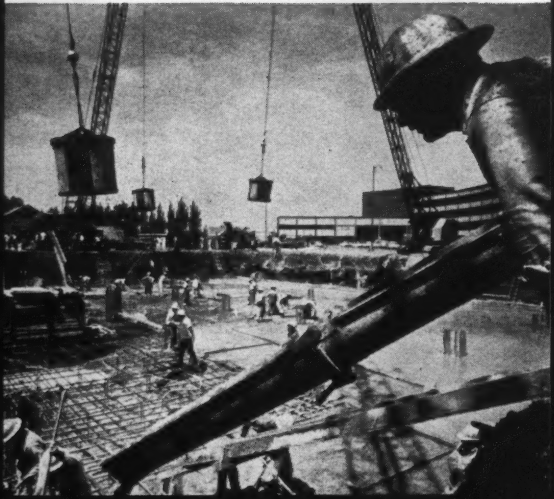
SILTERS CAN BE SAT ON—Maryland's attorney general last week told the state Water Pollution Control Commission it has the power to control and abate excessive stream siltation. The Commission learned that it could crack down on developers who "unreasonably" strip the land of trees and undergrowth causing erosion and silt discharges into the state's streams.

UNDER FIRE IN VERMONT—A meeting this week may kick off a Vermont legislature investigation of the State Highway Department. The investigation apparently sprang from discovery of an unanticipated excess in the state highway fund. Says one state senator, "We don't suspect any dishonesty in the department. But we want to see if it is as efficient as it should be."

THEY'LL BE BUSY—At a double letting last week by the New York State Department of Public Works a New York contractor was low bidder on two highway jobs totaling $32 million—more work than many contractors handle in a year. Slattery Contracting Co. of Maspeth, N. Y., won seven miles of access roads and two miles of arterial highway near the 1964 World's Fair ($20.7 million) in one contract, and .8 miles of the Gowanus Parkway in Brooklyn ($11.7 million) in the other.



Mr. Arnold Swenson,
Vice President
of Carl N. Swenson Company



HOW A ZEECON FORMULATION CUT PLACING TIME BY 15%

San Jose contractor places 2500 yards of concrete in just 17 hours

By using AquaREX, the Carl N. Swenson Company was able to complete a scheduled 20-hour monolithic pour in only 17 hours. AquaREX is a concrete admixture containing Crown Zellerbach's Zeecon, a controlled cement dispersant.

The 7-story Swenson Building will be the tallest in the new San Jose, California civic center area. Because of adobe soil conditions, a floating pad construction was chosen. It was necessary to construct a single 21,000 square foot slab of reinforced concrete with a minimum compressive strength of 2500 psi.

AquaREX was used for controlled retardation of initial set to prevent cold joints. The admixture reduced water requirements by 10-15%, yet the 5 sack mix was so workable that the pour was completed 3 hours ahead of schedule. Thanks to AquaREX, compressive strength was well over 3000 psi.

Approximately 10,000 yards of concrete—containing AquaREX—will be used in the modern office building. Says Vice President Arnold Swenson, "Do we like AquaREX? Actions speak louder than words: we're using it in our *own* building."

For *your* next job we urge you to consider the advantages of admixtures containing Zeecon. Set-retarding or non-retarding formulations are available, with or without added air entrainment in some areas.

Under construction above: Swenson Building, 7-story luxury building in San Jose, California. Owner-Contractor: Carl N. Swenson Co.; Architect: John S. Bolles (A.I.A.); Concrete Suppliers: San Jose Transit Mix Co.; Concrete Admixture: AquaREX by Concrete Chemicals Corporation, Redwood City, California.

For additional Zeecon information, write to your nearest formulator or to Crown Zellerbach.

AquaREX
Architectural Materials, Inc.
211 N. Ervay, Dallas 1, Texas

AquaREX
Concrete Chemicals Corporation,
725 Warrington Avenue,
Redwood City, California

ChemCon
Florida Laboratories, P. O. Box 672,
Gainesville, Fla.

Econo-MIX
Super Concrete Emulsions, Ltd.
1372 East 15th St., Los Angeles, Calif.

CONEX
Wescon Products, Ltd.,
3408 West 40th Avenue,
Vancouver, B. C.

EUCON
Euclid Chemical Company,
19218 Redwood Road,
Cleveland 10, Ohio

EZ-POUR
Western Admixture Company,
431 West 4th, Logan, Utah

CROWN ZELLERBACH
Chemical Products Division
Camas 6, Washington

WASHINGTON OBSERVER

- White House jacks up the mortgage market
- Builders oppose savings and loan tax plan
- BPR eases New Mexico highway aid restriction

● **Release of nearly $2 billion in Fanny Mae funds to support the mortgage market is announced by President Kennedy.** The total includes $950 million left over from the Eisenhower Administration, $750 million appropriated by Congress this year and $207 million unused from an emergency anti-recession housing bill passed in 1958.

The Federal National Mortgage Association also laid out rules for a new program of loans to banks and other institutions. Under the plan, Fanny Mae will make short-term loans to banks that will put up mortgages, they hold as collateral. Loans may run as much as 80% of the mortgages, with interest at 5¾%.

—

● **The house-building industry might suffer the loss of $5 billion in mortgage funds each year** if Congress approves Administration proposals to tighten taxation of savings and loan associations and mutual savings banks. At least, that is the contention of these institutions. They say the move would mean a decline of some 350,000 housing starts a year.

What the administration wants to do is tax savings institutions on the same basis as commercial banks. This would mean, say the mutuals, that their tax burden of $10 million a year would rise to as much as $500 million, drastically reducing their ability to attract funds through higher interest rates and thus cutting the money they have to finance mortgages. The Administration and commercial banks claim the bill would not reduce total available mortgage funds.

The pro-housing bloc in Congress will use every weapon it can to prevent any such change. And it probably will be successful this year. But the Administration, which needs the extra money for increased defense spending, plans to keep the issue alive in hopes of enactment in 1962.

—

● **Support for a bill to create a Department of Urban Affairs comes from the Senate Government Operations Committee.** But the committee's clearance of the measure probably will be as far as it gets this year. Most house members feel that more hearings are needed to clarify just what the proposed cabinet-level department would do.

As approved by the Senate committee, the bill would raise the Housing and Home Finance Agency to cabinet status. The department would become the center for research in metropolitan problems. Functions of HHFA would be changed very little. It still is expected that Robert C. Weaver, Housing Administrator, would head the department.

—

● **The Bureau of Public Roads has partially lifted the ban on federal funds for road construction in New Mexico.** It restored authority of the state to approve plans and call for bids on new projects (ENR July 6, p. 19). The bureau also will resume progress payments on projects under investigation, but only to 75% of the claims. The rest will be withheld pending a further investigation, expected to take several more weeks. Contractors named in the recent congressional investigation still are barred from participating.

PROVEN, LOW-COST WAY TO AVOID THIS

immediate protection against roadside erosion . . .

SOIL SAVER

Each day, erosion from rain and water run-off cuts into the highway investment of every state. If you share in the responsibilities of highway planning, building and renewal, then erosion, its defeat and prevention, is your concern. You, of all people, should know about Soil Saver.

Soil Saver is a heavy jute mesh. It is simple as dirt, and almost as cheap! It costs, in fact, some 75% less than sod, and 1400% less than asphalt or concrete paving. Wind, water or growing grass cannot displace it. Many leading state highway design engineers across the nation now include it in their original specifications. They have seen how it protects seed and soil in critical areas until grasses take over.

Soil Saver belongs in your plans. Get the facts . . . write for full details to Dept. EN-81.

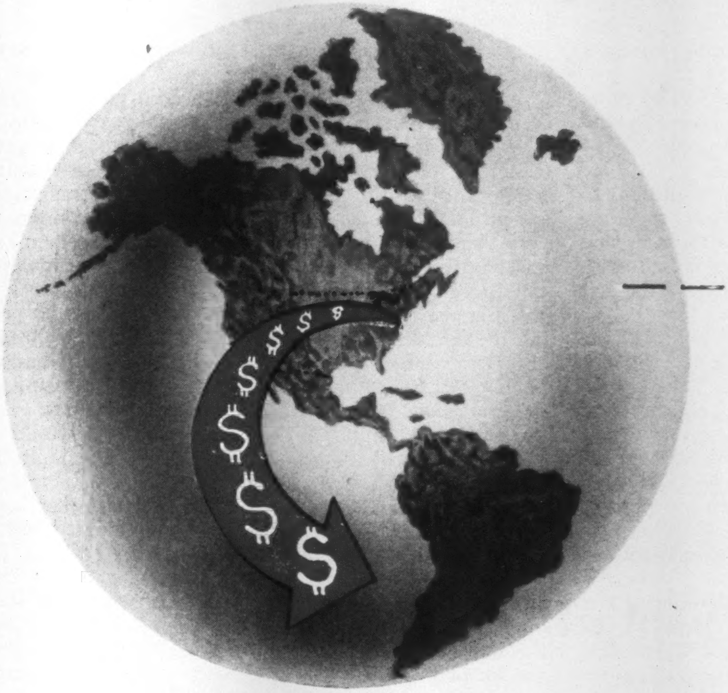
LUDLOW TEXTILE PRODUCTS
NEEDHAM HEIGHTS 94, MASS.
A Division of Ludlow Corporation

ABOVE: Soil Saver applied to critical center of steep grade median strip. **BELOW:** Stabilizing grass growing through Soil Saver heavy jute mesh.

Ludlow

SOIL SAVER
Heavy Jute Mesh
SIMPLE AS DIRT AND ALMOST AS CHEAP

Alliance for Progress calls for engineering before . . .



Aid-Funds Flow to Latin America

By Peter Weaver

"One of the most significant meetings in the history of the Western Hemisphere . . . is now taking place in Montevideo. . . ." So said President John F. Kennedy last week as the U.S. government worked to sell the Alliance for Progress proposal to Latin Americans meeting with North Americans in Uruguay.

And from the significance of the ideas and ideals springs significant practicality: The countries must plan before funds start flowing. The next two or three years will see consulting firms and planners shaping the base of the economic growth to come.

Douglas Dillon, Secretary of the Treasury, who heads the U.S. delegation at the Uruguayan meeting, hung a price tag on the development aid needs for Latin America over the next 10 years: $20 billion, with half coming from the U. S. government and its various lending agencies and the rest coming from European governments, private and other sources.

In Washington, an official at the Inter-American Development Bank, the recently created organization which will probably get the nod to manage much of the aid money for the 10-year program, believes that at least 60%, or $12 billion, of it will be poured directly or indirectly into the field of construction.

This $12 billion could well be matched by local government and private money coming from within the various Latin American countries to push the total price tag for construction and engineering services up to more than $20 billion for this decade.

The Latin American half of this hemisphere up to now has never seen spending like this. But even some of the pessimists are now thinking it possible that the money will range—anywhere from $15 billion to $25 billion in total amount.

For engineers, architects, contractors, sellers of equipment and all those involved in and around the construction business, it spells continental boom. But the boom has its hitches and it will have its rules.

The Alliance for Progress program boils down to this. The U. S. wants sound economic planning and housecleaning from the Latins and the Latins want money. The Latins now know that in order to get this money they have to have good short-, medium- and long-term programs and plans. This is where many Latin governments fall short—in planning.

"There will be a tremendous chance, a tremendous scope, for consulting firms, planners, designers and sanitary engineers in Latin America," says John H. Adler, hemisphere economist with the World Bank. He explains that Latin government delegations, rushing home after the Montevideo meeting, will make it immediately apparent that the best planning will get the money. Governments will be looking for engineering consultants in the fields of roads, water supply, area development and, most of all, housing on a grand scale.

U. S. engineering should have a commanding lead as an immediate result

---

***Peter Weaver**, back in Washington last week, has covered Latin America for past 6½ years for ENR—first in Rio de Janeiro, then in Mexico City.*

of Montevideo. But, Latin American experts warn that Europeans will be in hot competition because the Latins, this time, can spend the money on a company's competence and reputation and won't have to worry about that company's ability to arrange financing.

The medium- and long-term results coming from the meeting won't be felt for at least a couple of years. This might be disappointing to many U. S. citizens who want to see something for their money right away.

Here's where the money will be going in Latin American construction throughout the "billion dollar decade," as the 1960s are now being called.

There will be some $300-million to $400-million average yearly spending during the decade on consulting and engineering planning specialists, with the bigger lumps falling during the first five years.

Within the next three years, the emergency crash programs will be pushed. These will involve housing construction, farm to market roads, sanitation, water supply, schools and the "social projects" that found little money and therefore little interest in the last decade. The U. S. is already pouring $600 million into the healing of these "running sores" or social projects in Latin America.

Colonization was the word heard over and over again at Montevideo. Mexico has a plan to move at least 1,000 families from the scorched Bajio central region into the lush Yucatan Peninsula.

Peru's northlands have a plan for 600 families to be relocated and special mortgage loan associations are being formed in Panama (called Caja de Ahorros) for an immediate 500 houses costing $3 million. Ecuador has a new central housing bank that just got $5 million from the Development Loan Fund. Much more will be going into recolonization housing for the poor and into low-cost popular housing for low-income wage earners.

The colonization programs will evolve into entire area development. Take **Brazil.** Brazil presented a whopping $1-billion, 10-year program for its parched, impoverished northeast, which is the home for some 25-million of its 65-million population. Housing needs are immediate. Water needs were "urgent" five years ago, now they are "desperate." More than $400 million will have to come from the U. S. aid kitty. But much is expected from local and foreign private investors who will get tax benefits from the Brazilian government to build urban redevelopment facilities.

Mexico is applying for funds to boost its agriculture productivity in its dry northlands. Big irrigation projects are needed, river regulation, drainage. It could cost $105 million (World Bank has already started on this). In Bolivia, the Beni project is working on resettling Indians from the Altiplano down into a fertile plateau. Immediate money going into this: $20 million.

Roadbuilding will be active. Central America and northern South America are spots to watch here. The Inter-American Highway will be pushed hard but the Latin American roadbuilding pattern will change drastically from its super-highway splurge during the 1950s. Emphasis now will be on rural farm to market roads.

Argentina—sociologically—is way ahead of its Latin neighbors. Because of this advanced state, Argentina will be concentrating on such things during the 1960s as rebuilding its entire railroad system and pushing for a $100-million petrochemicals industry. Urban housing will be needed, but on a more sophisticated level than elsewhere.

Chile plans to spend $10 billion during the decade, broken down into $2.5 billion for direct construction costs, $2 billion for industry, $1.5 billion for transportation, $1.2 billion for power and some $500 million for urbanization and housing. The rest will go into such things as mining and agriculture. Chile hopes to get $1.5 billion for this from direct U. S. aid.

Latin America will need from $8 billion to $10 billion for additional electric power generating capacity during the 1960s. Big markets areas for this will be the usual: Argentina, Brazil and Mexico.

Industrial construction should push even farther in the big three already mentioned and in Chile and Colombia, maybe in certain Central American countries beginning to flourish in the C. A. common market area.

As the development boom gathers strength, the need for construction equipment will be great. But competition will come from local manufacturers in Argentina, Brazil and Mexico and from Europe and Japan among the other countries.

Besides the boom which most countries could experience, there might be a "bust" in some of the revolution-ripe, politically weaker countries.

Northern Brazil (looked at almost as a separate country politically), Peru, Ecuador, some Central American countries, Bolivia, Haiti and Dominican Republic might be trouble spots. Venezuela might see mining and industrial spurts in spite of political trouble.

Construction companies and engineering consultants will find that the big "spectacular" days for individual projects in Latin America are over. Now the emphasis will be on area development—lots of small projects. Besides the U. S. government lending and development organizations such as ICA, Export-Import Bank and Development Loan Fund, places to check for tips on development plans in Latin America are: World Bank, Inter-American Development Bank (probably the top of the list), International Finance Corp. and the Edge Act corporations such as Chase-Manhattan Bank, Chemical Bank New York Trust Co., and others which are going heavier into Latin American financing every year.

In any event, financing for the Alliance for Progress program will come from a variety of sources. Assuming funds are made available at a rate of $2 billion yearly, sources and estimated annual amounts are: U. S., $1.1 billion; U. S. private investment, $300 million; IADB's own resources, $50 million to $60 million; World Bank, $300 million, and investment from other countries, just over $300 million.

. . . And the Funds Begin to Flow

Even as the Alliance for Progress meetings convened last week at Punta del Este, Uruguay, the Inter-American Development Bank announced it had granted four loans of more than $25 million to Panama, El Salvador, Costa Rica and Venezuela. They were made under the Social Progress Trust Fund Agreement administered by the IADB.

Also, the IADB's president, Felipe Herrera, said that by year-end more than $100 million of the $394 million in the fund will be loaned. The larger total represents part of the $500 million in aid funds approved by Congress.

Requests from 14 Latin American countries to the IADB already total $371 million. Close to $320 million of the requests would go for construction: housing, water and sanitation, power development, flood control and colonization. The latter will call for highway construction to interior areas, clearing of those areas, then construction of housing and basic facilities.

Mexico's requests to the fund top the list at $104.7 million. Of this total $80 million would go for flood control, irrigation and colonization. Among the jobs would be a dam. The remaining $24.7 million would be committed to construction of well over 10,000 housing units.

Venezuela comes next with total requests of $62.4 million. Of the total, $32.4 million would be allocated to housing; $10 million to water and sanitation facilities, the rest to agrarian reform.

Chile asks for $56.7 million, out of which the largest single amount would be for agriculture and colonization. Housing outlays are placed at $8.7 million.

D&RGW Lets Contract for Rugged Rail Line in Utah

The Denver & Rio Grande Western Railroad has awarded a $5.5-million contract to Morrison-Knudsen Co., Inc., Denver for the construction of a 39-mile industrial spur in southeastern Utah.

The new line will follow Moab Canyon from the D & RGW main line at Crescent Junction to a $25-million potash mine and mill now under construction by Texas Gulf Sulfur Co. in the gorge of the Colorado River.

The tracks will pass through rugged and spectacular country, in the general area of Arches National Monument. At one point the line will pass under U. S. 160. Planned highway improvements will make the area overlooking the gorge more accessible to tourists.

The contractor will drive a 6,950-ft-long, 16 x 24-ft tunnel as a part of the project. Cuts and fills along the line will be heavy; one sandstone cut will be about 800 ft long and more than 100 ft deep. Work will begin immediately and is scheduled for completion late next year to coincide with the start of operations at the TGS mine. Output of the mine is expected to attain a level of from 8,000 to 11,000 tons daily.

In a separate operation, workers are relaying about 30 miles of main line trackage between Cisco and Crescent Junction with 136-lb rail. Cost of this work is estimated at about $1.75 million.

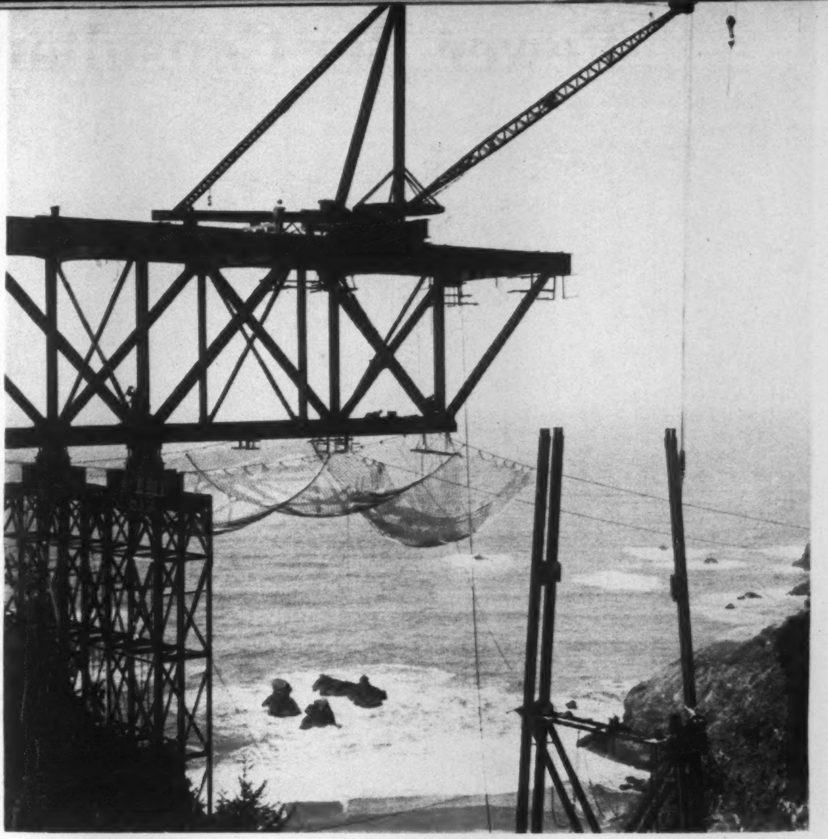
Delaware Gives Two-State Tollroad the Green Light

Construction of the long-awaited Northeast Expressway from Baltimore to the Delaware line can begin in about two months, says John B. Funk, chairman of the Maryland State Roads Commission.

The 40-mile, $90-million tollroad is planned to connect with a similar new route in Delaware. The two-state route will provide a direct connection with the Delaware Memorial Bridge, south of Wilmington. The bridge also is the southern terminus of the New Jersey Turnpike.

Mr. Funk's announcement was triggered by an action of the Delaware State House of Representatives last week. The Delaware legislature passed a measure that will enable the State Highway Department to issue revenue bonds to finance construction of the "Delaware Turnpike." A toll route from the bridge to the Pennsylvania line also is under consideration.

The Maryland section of the route can be completed by 1963, says Mr. Funk. The two commissions will meet soon to coordinate the two plans.



Daring Method Builds High Bridge

Structural iron workers of Bethlehem Steel Co.'s Pacific Coast Division are erecting the truss spans of the spectacular Thomas Creek Bridge on Oregon's scenic coastal highway (ENR Jan. 19, p. 38).

The 848-ft-long structure will be the highest bridge in the state; two steel towers supporting the truss spans rise 300 ft above the canyon floor.

Designers initially planned a steel arch. Site surveys, however, showed that the south canyon wall could not support the load from an arch. The final design provides a 30-ft-wide roadway on 30-ft-deep trusses.

Bethlehem engineers devised an ingenious plan of erection. The plan was based on successive cantilevering of truss spans and the erection of falsework towers.

Beginning at the south abutment, erection crews cantilevered the trusses 53 ft; using a 25-ton, stiff-leg derrick mounted on the trusses, they then built the first falsework tower from the bottom up to meet the bridge. They then cantilevered 53 ft and built a second falsework tower; with this tower completed, the first was removed.

From the second falsework tower, they again cantilevered the trusses and built a third falsework tower (see photo). This tower was 180 ft high, composed in part of steel sections that eventually would form the upper half of the north and south faces of the permanent north tower. With this falsework tower in place, they again cantilevered the trusses and erected the permanent south tower, working from the bridge deck. Steel sections were lowered 300 ft from the bridge to the canyon floor by the derrick perched near the end of a 159-ft cantilever.

Setting the first sections for the tower legs was a tricky operation. The tower tapers from 80 ft wide at the bottom to 30 ft wide at the top. This angle made it difficult for the erection crew to position the sections on erection bolts set in the concrete piers.

After cantilevering the central span, crews erected the lower half of the north tower from the deck. The derrick was then moved backward, the third falsework tower dismantled and some of its steel used to complete the north tower.

Distance between the north tower and north abutment was covered in two jumps, making use of one falsework tower.

Frequent heavy rains, fog and high winds in the area hampered construction. The bridge is designed to withstand winds up to 108 mph, with gusts up to 120 mph.

Fewer Big Consultants, A-Es; More

1960—$100,000 or More in New Business *(ENR DATA)*

ENGINEERS	All—$100,000 or more			$1,000,000 or more			$500,000-$1,000,000			$100,000-$500,000		
Type of Work	1960	1959	% Change '59-'60	1960	1959	% Change '59-'60	1960	1959	% Change '59-'60	1960	1959	% Change '59-'60
TOTAL	1,794	1,805	− 0.6	895	895	0	324	322	+ 1	575	588	− 2
OTHER THAN BUILDING												
Waterworks	351	400	−12	194	247	−21	60	55	+ 9	97	98	− 1
Sewerage	526	592	−11	257	327	−21	90	104	−13	179	161	+11
Bridges	64	76	−16	41	52	−21	4	9	−56	19	15	+27
Highways and streets	210	236	−11	112	136	−18	27	40	−32	71	60	+18
Earthwork, dams, waterways	71	118	−40	45	83	−46	8	13	−38	18	22	−18
Airports	117	137	−15	71	102	−30	15	13	+15	31	22	+41
Unclassified	226	274	−18	131	165	−21	36	34	+ 6	59	75	−21
BUILDING												
Industrial	349	395	−12	189	240	−21	48	33	+45	112	122	− 8
Housing, commercial, public	773	763	+ 1	521	526	− 1	156	142	+10	96	95	+ 1
Housing	283	267	+ 6	213	209	+ 2	43	40	+ 8	27	18	+50
Schools	261	227	+15	201	172	+17	39	34	+15	21	21	0
Offices, private	64	60	+ 7	56	46	+22	7	11	−36	1	3	−67
Offices, public	26	27	− 4	23	26	−12	3	0	. . .	0	1	−100
Shopping centers, stores	89	86	+ 3	71	67	+ 6	15	12	+25	3	7	−57
Public ind'l, military, A-power	55	89	−38	44	70	−37	8	8	0	3	11	−73
Other building, private	186	159	+17	142	107	+33	28	29	− 3	16	23	−30
Other building, public	143	96	+49	103	69	+49	20	18	+11	20	9	+122
FEDERAL (included above)	100	156	−36	78	126	−38	7	15	−53	15	15	0
ARCHITECT-ENGINEERS												
TOTAL	432	455	− 5	319	326	− 2	56	54	+ 4	57	75	−24
OTHER THAN BUILDING												
Waterworks	31	51	−39	30	43	−30	0	5	−100	1	3	−66
Sewerage	43	76	−43	37	63	−41	0	5	−100	6	8	−25
Bridges	13	34	−62	11	30	−63	0	2	−100	2	2	0
Highways and streets	24	50	−52	22	47	−53	0	1	−100	2	2	0
Earthwork, dams, waterways	16	27	−41	16	25	−36	0	1	−100	0	1	−100
Airports	47	96	−51	40	90	−56	2	0	. . .	5	6	−17
Unclassified	65	102	−36	62	92	−33	2	3	−33	1	7	−86
BUILDING												
Industrial	142	182	−22	113	150	−25	15	9	+67	14	23	−39
Housing, commercial, public	375	432	−13	292	351	−17	47	48	− 2	36	33	+ 9
Housing	153	163	− 6	128	143	−10	17	16	+ 6	8	4	+100
Schools	190	190	0	161	155	+ 4	16	18	−11	13	17	−24
Offices, private	79	55	+44	74	51	+45	4	4	0	1	0	. . .
Offices, public	29	33	−12	28	33	−15	1	0	. . .	0	0	0
Shopping centers, stores	59	52	+13	49	49	0	10	1	+900	0	1	−100
Public ind'l, military, A-power	29	33	−12	22	29	−24	4	1	+300	3	3	0
Other building, private	100	100	0	87	90	− 3	9	5	+80	4	5	−20
Other building, public	86	82	+ 5	76	76	0	3	3	0	7	3	+133
FEDERAL (included above)	67	117	−43	59	111	−47	3	2	+50	5	4	+25
ARCHITECTS												
TOTAL	3,787	3,534	+ 7	2,144	1,951	+10	833	734	+13	810	849	− 5
OTHER THAN BUILDING												
Waterworks	8	3	+167	5	2	+150	2	1	+100	1	0	. . .
Sewerage	9	9	0	6	4	+50	1	0	. . .	2	5	−60
Bridges	0	6	−100	0	4	−100	0	0	0	0	2	−100
Highways and streets	15	10	+50	11	8	+38	1	1	0	3	1	+200
Earthwork, dams, waterways	22	21	+ 5	20	16	+25	0	1	−100	2	4	−50
Airports	77	96	−20	54	70	−23	11	7	+57	12	19	−37
Unclassified	204	225	− 9	124	128	− 3	27	25	+ 8	53	72	−26
BUILDING												
Industrial	696	691	+ 1	312	316	− 1	107	92	+16	277	283	− 2
Housing, commercial, public	3,349	3,058	+10	2,110	1,896	+11	766	684	+12	473	478	− 1
Housing	1,324	1,200	+10	987	911	+ 8	220	190	+16	117	99	+18
Schools	1,406	1,287	+ 9	963	870	+11	290	258	+12	153	159	− 4
Offices, private	329	247	+33	268	182	+47	41	37	+11	20	28	−29
Offices, public	121	124	− 2	98	97	+ 1	15	21	−29	8	6	+33
Shopping centers, stores	333	313	+ 6	257	238	+ 8	48	50	− 4	28	25	+12
Public ind'l, military, A-power	68	68	0	53	51	+ 4	6	8	−25	9	9	0
Other building, private	717	662	+ 8	505	439	+15	126	118	+ 7	86	105	−18
Other building, public	451	372	+21	348	265	+31	55	60	− 8	48	47	+ 2
FEDERAL (included above)	168	196	−14	150	161	+93	7	17	−59	11	18	−39

Architects

The $100,000-plus clubs of two of three professional groups in construction lost members last year; the third showed an increase.

Consulting engineers who obtained $100,000 or more in new design work slipped fractionally from a record 1,805 in '59 to 1,794 last year. The number of architect-engineers getting such volume dipped 5% from 455 to 432. But the number of $100,000-plus architects rose 7% last year to 3,787. (Dollar volume is based on estimated constructions of all projects reported by ENR.)

Consulting engineers who obtained new design work of $1 million or more matched 1959's record total for this category—895. The middle-size group—$500,000 to $1 million—showed a 1% increase to 324. The $100,000 to $500,000 group, however, registered a 2% drop from 588 in '59 to 575 last year.

Architect-engineer membership in the $100,000-plus club slipped for the second consecutive year, the total now well below the record of 494 in 1955.

A-Es in the largest-volume category —$1 million or more—declined 2% to a total of 319. The middle-size group slipped 4% to the small total of 56, while the $100,000 to $500,000 group dropped 24% to 57, a new low.

Eleven out of 16 individual types of design drew fewer A-Es in 1960 than in 1959. Three types retained the same number of designers, and only two—private office buildings and other private buildings—brought in a larger number of architect-engineers.

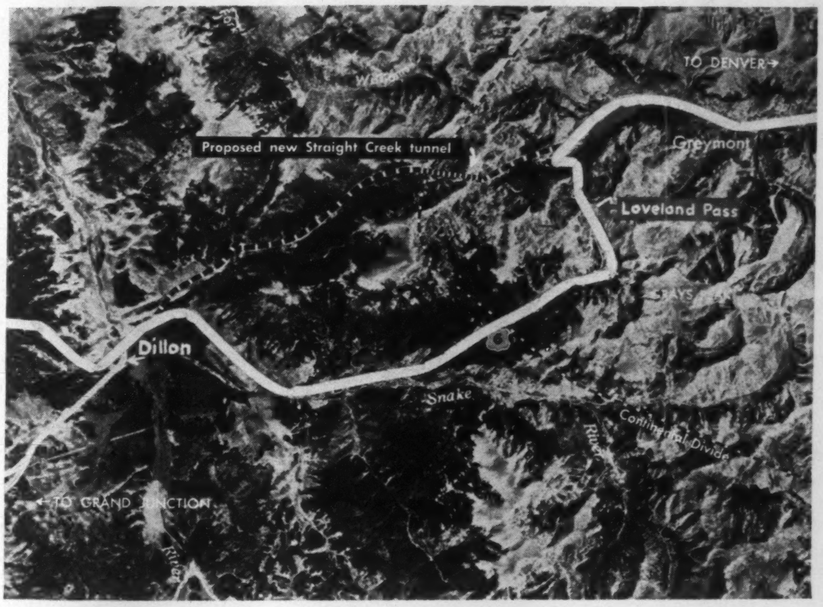
Those A-Es doing work having an estimated construction value of $1 million or more, went into the private office buildings market in larger numbers. Their total increased by 45%.

Architects with $100,000 or more in new design business went to a record for the second consecutive year.

Those in the $1-million-or-more category increased their number by 10% with a 1960 total of 2,144. The middle-size group also expanded, rising 13% to 833. The smallest-volume architects dipped 5% in number to a total of 810, as their colleagues moved into the middle and top-size categories.

Architects as a whole apparently benefited from the rush for buildings.

ENR's volume of new proposed work in '60 shows that the design market for buildings, both public and private, jumped 15%. Other-than-building proposals, exclusive of bridges and highways, slumped 13%. Highways and bridges rose 20%, but the demand for consultants declined as highway departments continued to increase their permanent staffs.



Road Tunnel Will Pierce Divide

The Colorado Department of Highways has approved contracts with three consulting engineers to design a tunnel and its approaches to carry traffic under the Continental Divide at Straight Creek, some 70 miles west of Denver.

The new tunnel will be on Interstate 70, which will pass through some of the most rugged (and most scenic) country in North America.

Gov. Steve McNichols has set a deadline of mid-1962 for the completion of plans and awarding of construction contracts.

Colorado plans a two-lane tunnel 32 ft wide, 34 ft high and about 9,000 ft long. It will be the first highway bore under the Continental Divide. The east portal will be at an elevation of 11,021 ft; the west portal at 11,100 ft. Inside the tunnel there will be 17-ft vertical clearance for vehicles; the upper portion of the tunnel will house air ducts and ventilating equipment.

Second parallel tunnel will be built later, when traffic requires it, says the governor.

Interstate 70 will traverse the Colorado Rockies from Denver to Grand Junction, generally following the present route of U. S. 6. The new tunnel will be on new location from U. S. 6 near Loveland Pass to the same highway near the new site of the town of Dillon.

The tunnel will cut slightly more than three miles from the present route over Loveland Pass (11,992 ft). More important, it will avoid the dangerous "Seven Sisters" snowslide area. Last winter, 27 snowslides occurred in this area; costs of keeping Loveland Pass open during the winter are high, and will be minimized by the tunnel.

Preliminary studies indicate the tunnel will be driven through solid granite. Engineers will require lining of the tunnel with concrete only where faulty rock is encountered.

International Engineering Co., of San Francisco will design the tunnel under a negotiated contract. Engineers estimate cost of the tunnel at between $20 million and $24 million. Donald C. Sutherland, Inc. of Denver will design the nine-mile-long west approach, expected to cost more than $6 million. Meurer and Knoerle of Denver will design the east approach, estimated to cost about $1 million for two miles.

Commissioning of consultants to design the tunnel and its approaches climaxes a long period of exploration and discussion. In 1941, the Highway Department drilled a pioneer bore under Loveland Pass. Workers ran into bad ground and any effort to drive a tunnel there was abandoned.

A report submitted in 1954 by two New York City consultants (Singstad & Baillie and Howard, Needles, Tammen & Bergendoff) recommended the Straight Creek route. A second report by the same engineers in 1956 emphasized that recommendation.

A third report, prepared by E. Lionel Pavlo Engineering Co. of New York City and submitted in 1960, also recommended the Straight Creek site.

Colorado engineers and officials fought several years to get the through-the-mountains highway included in the Interstate System.

The dispute was not settled until 1959, and construction funds for this section of Interstate 70 will not be available until July 1, 1962.

Utility Seizure May Speed Work

British Columbia's expropriation of two privately owned corporations two weeks ago may have forced the way clear for $1 billion to $2 billion worth of hydroelectric construction on the Peace River and in the Columbia River Basin.

Officials of the newly nationalized B. C. Electric Co. have pledged an immediate construction start on a $610-million hydro development on the Peace (ENR Oct. 8, 1959, p. 17). And the Canadian government may ease its power-export ban as the only feasible way of getting the provincial government to accept simultaneous international development of the Columbia, which could generate nearly a billion dollars worth of construction in the U. S. and Canada in the next 10 years (ENR Jan. 26, p. 29).

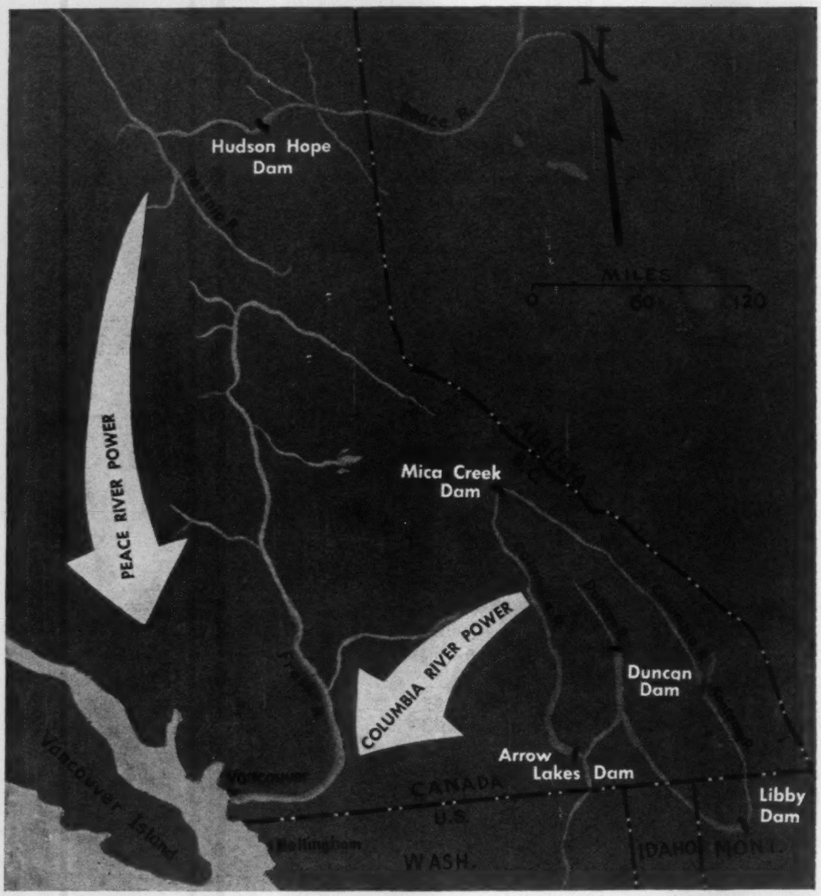
B. C. Electric Co. is the province's biggest electric utility, with a stock value of $110 million. It operates 17 power developments with a present generating capacity of 1 million kw and an estimated ultimate capacity of more than 2 million kw. The seizure makes electric power a virtual government monopoly in British Columbia. Only two power companies continue to operate privately, and they will be taken over after government studies of them are complete, says B. C. Premier W. A. C. Bennett.

The Peace River Power Development Corp., the other firm seized, had explored development of water power and other natural resources in northeast British Columbia for several years. After spending $5 million to $7 million, the firm applied last December for a provincial license to start hydro development on the Peace.

Mr. Bennett's decision to expropriate the companies was triggered by completion of a seven-month study of the relative costs of Peace and Columbia power. It showed that privately developed Peace River power would cost more than half again as much as public power from either river. Costs under public development of the Peace and Columbia would be "practically indistinguishable," the report said.

Mr. Bennett called the provincial legislature into special session to vote on his nationalization proposal. The body passed it unanimously. Fundamental authority for the seizure lies in the British North America Act of 1867, which serves in some respects as the Dominion's constitution. It gives the provinces control of natural resources.

The province issued $100 million in bonds to pay B. C. Electric's parent company, B. C. Power Corp., for the expropriated firm's stock. B. C. Electric, as a Crown corporation, will reimburse the Peace River group.



Peace hydro is state venture now; it may break Columbia stalemate.

The study was made by the British Columbia Energy Board, specially created for the task last December. Meanwhile, both the Peace River group's license application and a U. S.-Canada Columbia development treaty lacking only Canadian ratification had been hanging fire.

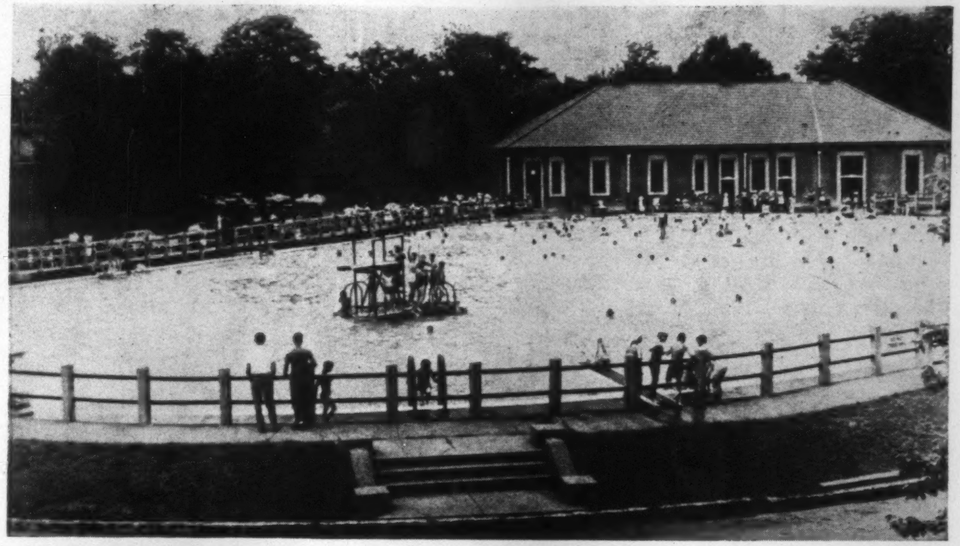
The Peace River plan entails construction of two major dams, 3.1 million kw of generating capacity and a 500,000-volt transmission line 550 miles long. The first phase includes a 600-ft-high, $375-million earth dam on the Peace near Hudson Hope. British Columbia has obtained a $75-million credit to start work. "We hope to have engineers on the ground within a week," says Gordon H. Shrum, new chairman of the board of B. C. Electric and former head of the B. C. Energy Board.

The Columbia River plan includes four major dams—three in Canada, one in the U. S.—and related generating and transmission capacity.

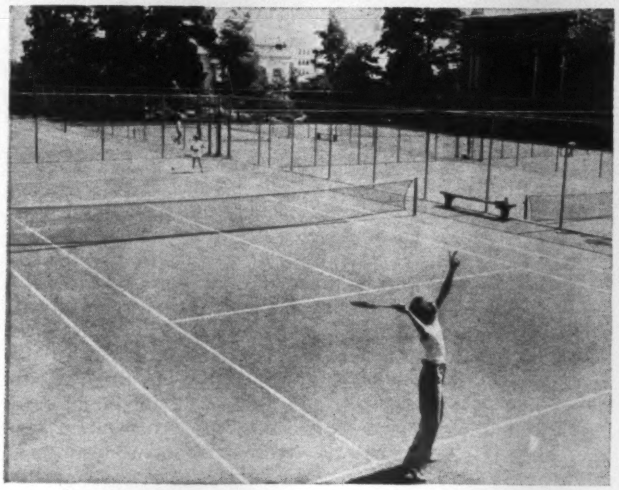
Premier Bennett has maintained all along that he wants to develop both rivers but must be allowed to export surplus power until the province develops sufficiently to need it all at home. The B. C. Energy Board supported this stand in its report. It said simultaneous development could benefit economic and employment conditions in B. C. but only if a very large market could be found elsewhere. The board said the only potential markets outside the province are the Pacific Northwest, California and possibly Alberta.

Canada presently opposes power export on the grounds that once exported it can't be regained because U. S. communities that come to depend on it can't be asked later to do without it.

Following the seizure, which took the Canadian government completely by surprise, the national government's chief spokesman, Justice Minister Davie Fulton, said Ottawa would entertain an application for temporary export of power if the B. C. government would produce a firm contract with U. S. authorities. However, he is reported also to have said there is no room for both the Peace and Columbia projects at the same time.



ASPHALT SWIMMING POOLS provide large swimming areas at low cost. Their excellent weathering qualities are based on asphalt's resistance to pressure, freeze-thaw, chlorine, and abrasion. Asphalt wading pools serve equally well as skating rinks.



ALL-SEASON TENNIS COURTS paved with asphalt are fast, true, unaffected by frost, and can be played on immediately after rain.

RESILIENT PLAYGROUND PAVING of asphalt answers the need for a smooth, hard surface which can be used year-round in all kinds of weather. Fewer injuries occur on asphalt than on untreated earth or loose aggregates. Maintenance is negligible.

ASPHALT FROM ESSO OPENS THE WAY TO LOW-COST RECREATION

Asphalt from Esso gives motorists a smooth, comfortable ride on many of the nation's best roads. It also plays a big part in meeting the growing need for recreational facilities. In both fields, asphalt is saving money for taxpayers.

Esso refines asphalt in a wide range of grades to suit a variety of recreational and other purposes; delivers it from nine conveniently located supply points so you can always get prompt deliveries. For technical information about this economical and versatile material, write us at 15 West 51st Street, New York 19, New York.

HUMBLE OIL & REFINING COMPANY Esso

Congress Buys the Shelter Survey

The Defense Department began training personnel last week to run the nationwide fallout shelter survey. At the same time, Congress approved the Kennedy Administration's accelerated civil defense program.

The $93-million shelter survey is the key element in the Administration's new CD plans. The Administration believes that the fastest and cheapest way to get nuclear fallout shelter protection for as many people as possible is to identify community-type facilities now available in public and privately owned building basements, subways, tunnels, mines and other underground structures.

The next step would be to increase capacity and upgrade ventilation and other facilities in these existing structures, then to stock them with a two weeks' supply of food, water and medical equipment.

Only after the survey is completed would the Pentagon begin to consider plans for building brand-new shelter facilities.

The survey, which will begin within the next few months, will be conducted by local architectural and engineering firms hired by regional offices of the Army Corps of Engineers, the Navy's Bureau of Yards and Docks, and the General Services Administration.

Over 100 key officials from the Corps' district and division offices and the Bureau's field offices, who will hire and train the survey contractors, are now attending a four-week course at Ft. Belvoir, Va., covering what the Pentagon calls "atomic-oriented structural analysis."

The course, which began last week, will provide architects and engineers with procedures and standards for "(1) evaluating the fallout shelter potential of existing structures, and (2) modifying structures from the standpoint of radiation shielding and habitability to improve their worth as fallout shelters."

"These same procedures and standards," says an OCDM manual on which the course is centered, "may be used for preliminary design to incorporate shelter into new structures."

Meanwhile, Congress approved a $207.6-million civil defense appropriation for the Defense Department. In addition to the shelter survey, funds are earmarked for testing construction techniques to expand shelter space, reinforce basements, and install forced-draft ventilation in existing federal buildings; planning and building shelters in new federal structures; stockpiling civil defense supplies; and research and development on CD warning and communications systems. Says one official: "The effect in the home shelter field will not be significant. Home shelters are too costly and would provide protection for a very limited portion of the population."

In addition, Congress voted $86.5 million for the Office of Civil and Defense Mobilization for assorted functions—none of which, however, involve construction. Much of this money will be transferred to the Defense Department under the recent organizational overhaul, which took major CD functions away from OCDM.

In all, Congress has voted a total civil defense appropriation this year amounting to almost half the funds approved over the past decade.

Last week, the House military operations subcommittee, headed by Rep. Chet Holifield (D., Calif.), a longtime CD crusader, continued its hearings on the new Administration program. The consensus was that if Washington's new interest in civil defense is serious, the federal government will have to spend from $1 billion to $3 billion a year on CD as long as there is a cold war. The money would go primarily to finance new fallout shelter construction.

Hayes Claims Capehart Ownership

Contractor Hal B. Hayes of Los Angeles charges that the federal government illegally took possession of five defense housing projects for which his companies held construction contracts. In five federal-court suits, Mr. Hayes asks return of the projects to his control, plus $20 million in damages from the federal government and several construction companies.

Among government defendents are Secretary of the Air Force Eugene M. Zuckert, Secretary of the Navy John B. Connally and Federal Housing Administration Commissioner Neal J. Hardy. Co-defendents in the civil actions include Nomellini Construction Co., Stockton, Calif.; F. P. Lathrop Construction Co., Berkeley, Calif.; T. A. Loving Co., Goldsboro, N. C.; and Harllee-Quattlebaum Construction Co., Florence, S. C.

The suits stem from government takeover of the projects after Pentagon officials declared the Hayes companies defaulted on 3,448 Capehart housing units valued at $56 million. Other construction companies subsequently took over the projects with government authorization. At the time, Mr. Hayes called the move illegal because his corporations held 50-year lease-hold agreements with the Defense Department (ENR Aug. 18, 1960, p. 141).

Mr. Hayes requested the courts for injunctions barring the substitute construction companies from continuing work at the projects. He contends his companies own the 50-year leases and that by evicting his companies, the government denied them property, rents and profits.

When the issue first boiled up last year, legal authorities in the Defense Department evinced little concern over Mr. Hayes' ownership claims. They did tell ENR, however, that their own arguments stem from their interpretation of the law and those opinions were untested in court.

The Hayes-government feud results from the intricacies of the Capehart program. It works this way:

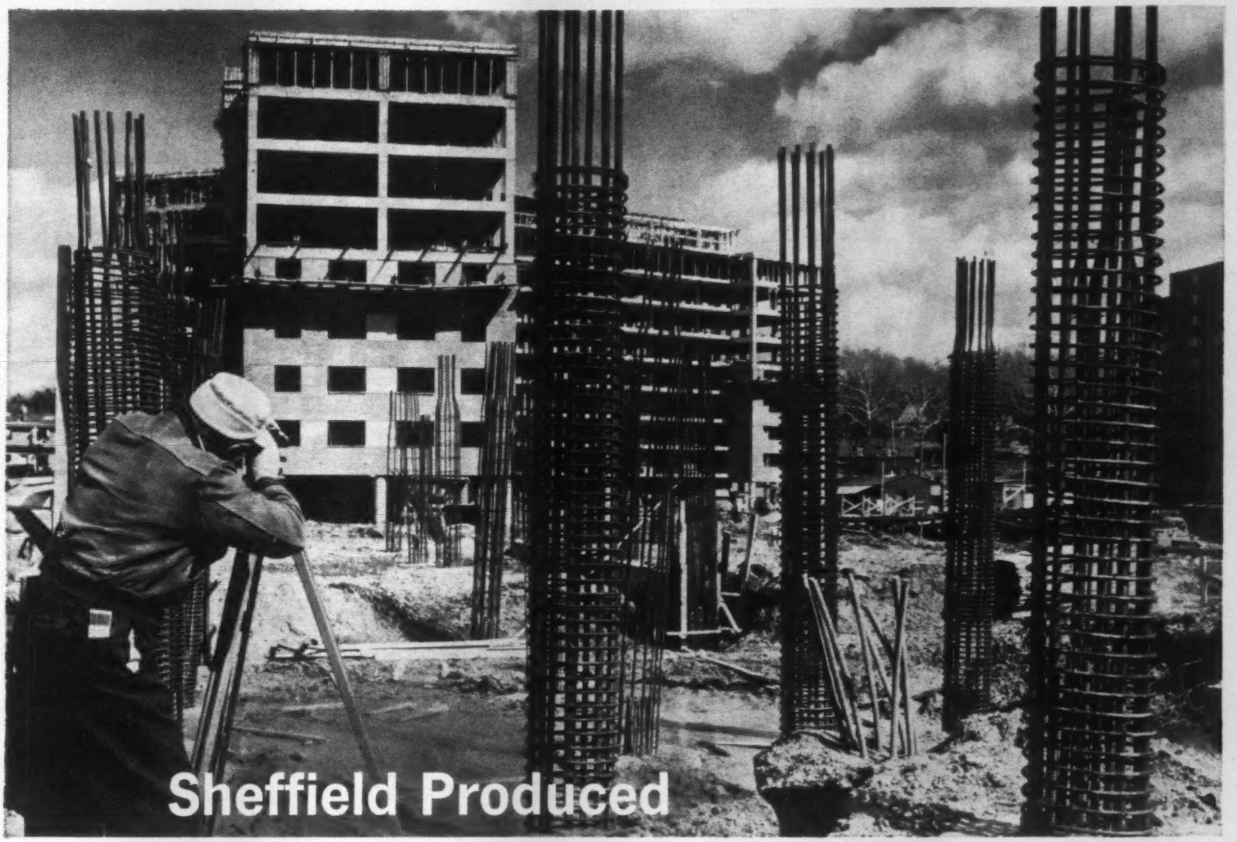
- After Congress authorizes a housing project for one of the military departments, the service advertises for competitive bids from builders. The contract goes to the lowest bidder.
- Under the contract, the builder must form a mortgagor corporation. It obtains financing, title insurance and a surety bond, with its officers responsible for construction.
- The government owns the land on which the projects are built, but to expedite financing, the corporation receives title to the site in the form of a 50-year lease-hold agreement between the mortgagor corporation and the military department. Mr. Hayes believes the lease-hold is the loop-hole.

Engineer Bar in Code May Get Court Test

A Denver building-code provision barring design of multistory buildings by state-licensed engineers may get a U. S. District Court test.

Last month a federal judge overruled the city's motion for summary judgment against a lawsuit filed against the city last year by Kenneth A. Heron, a consulting engineer licensed in Colorado. The judge said that the issue raised by Mr. Heron's complaint involves a conflict of jurisdiction between the City and County of Denver and the state of Colorado in regulating engineers.

Mr. Heron began a legal battle against the City of Denver in 1953 when he filed suit to force the city's chief building inspector to issue him a building permit for an old-folks' home. Mr. Heron's main office is in Chama, N. M.; he has another in Denver.



Shipped On Time
To Serve A Long Time

This is the new multi-million-dollar Wayne Minor Court on the edge of downtown Kansas City. It covers four city blocks. There are 20 buildings, 738 apartment units. From every standpoint, they are designed and built for permanence.

It took steel to help give this project that permanence and Sheffield Crescent Reinforcing Bars were ready on time to bond concrete and steel into sturdy pillars of strength. Stresses are distributed so evenly by Sheffield Reinforcing Bars that the bars are self-anchoring.

For commercial buildings, schools, bridges, highways — wherever steel construction materials are needed — Sheffield is your fast, reliable source for on-schedule shipments.

Big plant production at three Sheffield steel mills serves the Midwest, Gulf Coast and Western regions of America. To get the job rolling, call your Sheffield distributor, or **Sheffield Division, Armco Steel Corporation, Sales offices in Kansas City, Missouri, or Houston, Texas.**

SHEFFIELD

Crescent Reinforcing Bars

Strong
Tough
Economical
Efficient
Lasting

Steel

ARMCO Sheffield Division

'61 FORD TANDEM AXLE TRUCKS

BROADER WARRANTIES... GREATER DURABILITY... BIGGER CHOICE!

FORD DIVISION, Ford Motor Company,

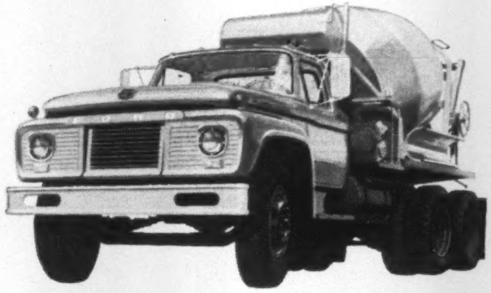
FORD HAS WARRANTED TO ITS DEALERS, WHO IN TURN WARRANT TO YOU:

●New Super Duty V-8 Engines for 100,000 miles or 24 months!

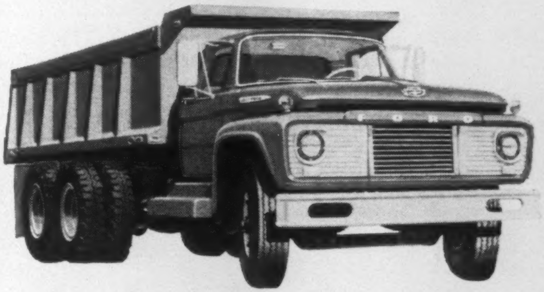
●New Ford Trucks for 12,000 miles or 12 months!

Ford's rigid quality control program gives you unsurpassed dependability! Positive evidence of uniformly high production and inspection standards is the exclusive new 100,000-mile engine warranty. On 401-, 477- and 534-cu. in. Super Duty V-8 engines, each major engine part (including block, heads, crankshaft, valves, pistons, rings), when engine is used in normal service, is warranted by your dealer against defects in material or workmanship for 100,000 miles or 24 months, whichever comes first. Warranty covers the full cost of replacement parts . . . full labor costs for the first year or 50,000 miles, sliding percentage scale thereafter.

In addition, an extended warranty covers all 1961 Ford Trucks of any size. Each part, except tires and tubes, is now warranted by your dealer against defects in material or workmanship for 12 months or 12,000 miles, whichever comes first. The warranty does not apply, of course, to normal maintenance service or to the replacement as normal maintenance of such items as filters, spark plugs and ignition points. *No other trucks give you such protection for your investment; never before could you be so confident of long-range durability!*



Tougher tandems offer greater strength in chassis, cab and sheet metal for longer life. Full-Torque flywheel power take-off is available for more efficient drive of transit mixers and heavy-duty equipment.



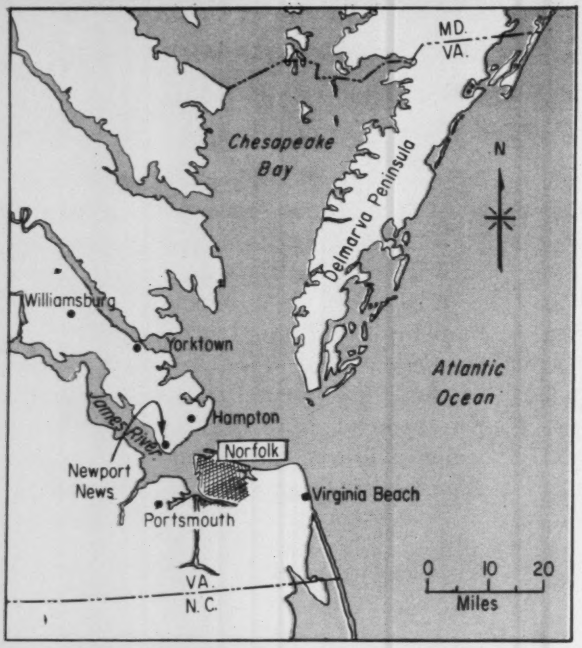
Timken or Eaton rear axles, with capacities up to 38,000 lb., are available in all Super Duty tandems. High capacity front axles have wider track for increased stability when cornering or in rough terrain.

GVW's up to 51,000 pounds permit big, profitable payloads. Heavier gauge metal and stress-isolating independent mounting for radiator, fenders and cab give you greater durability.

Tandem Axle models are available with tilt cabs. As with conventional tandems, aluminum walking beams, wheels and fuel tanks are offered to cut weight . . . increase payload capacity.

QUALITY-BUILT...
MAINTENANCE-
ENGINEERED

FORD TRUCKS COST LESS



With an enthusiastic attack on its ills, the 279-year-old port city of Norfolk, Va., is proving that civic rejuvenation can spread just as contageously as blight.

Fitting Cities to the Future:

Norfolk Builds for the Big Move

Federally aided urban renewal runs a pretty humdrum course in most cities. It does a limited job, but for one reason or another never quite catches the popular imagination.

Just the opposite is true in Norfolk, Va. Slum clearance catalyzed a popular reaction that has transformed both the appearance and attitude of the city in the last 10 years.

Physically, downtown Norfolk is changing so fast that wartime residents revisiting the city say they have trouble getting their bearings. Old neighborhoods, old landmarks, old streets are giving way to new ones. And an old atmosphere of decay has given way to a feeling of regeneration. The city vibrates with a new civic pride and with ambition to get on with the urgent business of growing bigger and more important. Citizens and officials alike affirm the conviction that Norfolk is a comer.

Norfolk has more than doubled in population since 1940. During the last 10 years, while most big U.S. cities were losing population, it was picking up nearly 50%. At 306,000, it is Virginia's biggest city. It calls itself the financial and commercial hub of Tidewater Virginia and a broad area of northeastern North Carolina. But it isn't through growing. Since the city's initial venture into slum clearance 10 years ago, a passion for self improvement and status has taken hold in all areas of public and private enterprise. It is most evident in bridge and tunnel construction, public and private building construction and port development.

Highway access to the city is undergoing a revolution with $500 million worth of bridges and tunnels under construction or completed within the last 10 years. Vehicular movement within the city has speeded up with completion of major links in an urban highway system and several rail underpasses and overpasses. Land approaches to the city are under study as part of the development of a regional highway master plan by Norfolk and its neighbors.

New office, store, institutional and public buildings and a new hotel have given the city a new sky line.

Tonnage handled by ships in Hampton Roads—the great natural harbor that serves Norfolk, Portsmouth, Newport News and Hampton—has increased sharply since 1950. Both private and public plans are afoot to spend millions enlarging the port for even greater tonnages.

To keep pace, the Hampton Roads Sanitation Commission is girding for a population increase of 500,000 by the year 2000 in the district it serves—the cities of Norfolk, Newport News, Hampton and South Norfolk and parts of the counties of Norfolk, Princess Anne, Nansemond and Isle of Wight (Portsmouth prefers to go it alone). The commission presently has under consideration a long-range engineering study completed last year that calls for spending about $8 million for construction by 1965 and about $17 million during the following 35 years.

The city of Norfolk's division of water supply completed a $13-million expansion in 1954. It is presently working on a $9-million capital program to take care of needs until 1968 and foresees additional expansions of supply in 1968 and 1978.

• Federal aid was the key—Although Norfolk lacked the money to start

From Back Street to Main Street

clearing blighted areas in earnest until the federal housing act of 1949 made federal help available, the city's slum-clearance program had its beginnings much earlier. A study in 1937 revealed that crime was four and a half times worse in Norfolk's slums than in the rest of the city and that taxpayers were subsidizing five slum areas to the tune of $750,000 a year in police, fire, health and other municipal services. As a result of the study and follow-up analysis, the city council created the Norfolk Housing Authority (later renamed the Norfolk Rehabilitation and Housing Authority), which has planned and carried out the city's housing and urban renewal programs.

The outbreak of World War II deferred slum clearance efforts. The Housing Authority was scarcely able to cope with new problems let alone old ones. War workers and service personnel thronging to the shipyards and military and naval establishments turned the city into perhaps the worst housing problem in the country.

After World War II, Norfolk, like many other U. S. cities, found itself competing with its suburbs. Retail business had begun a steady decentralization during the war to follow the military personnel and war workers forced to live out of the city. The pace of the exodus accelerated with the lifting of building restrictions shortly after hostilities ended.

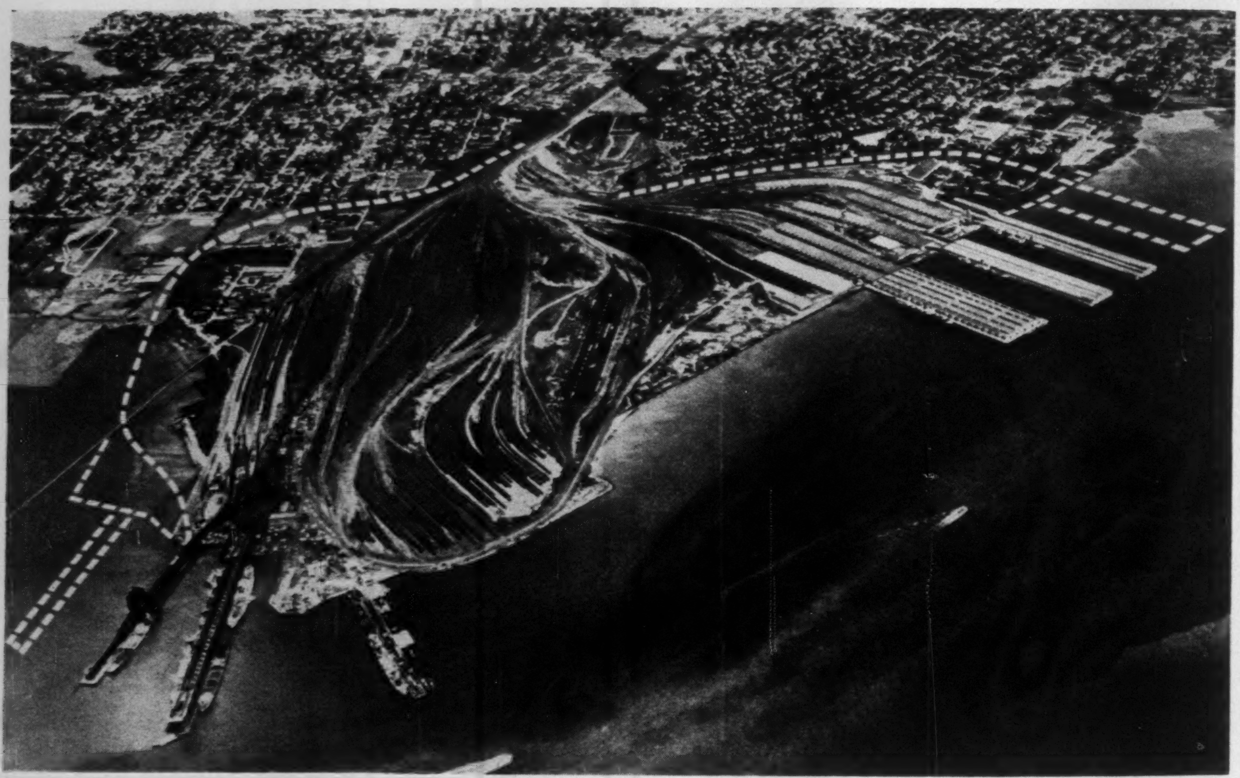
The city proper was in poor shape to compete. Slums and blight surrounded the downtown business area and interlaced outlying districts. Vehicles downtown crawled laboriously through narrow streets and to get there depended on inadequate urban highways. The downtown business district was hemmed in on the south and west by water and on the north and east by the main line of the city's principal railroad, with only one underpass.

After Congress passed the Federal housing act of 1949, Norfolk was one of the first two cities in the country to qualify for help. (Galveston was the other.) Its credentials included a new slum study by the Housing Authority and the engineering firm of Harrison, Ballard & Allen, documenting Norfolk's ills:

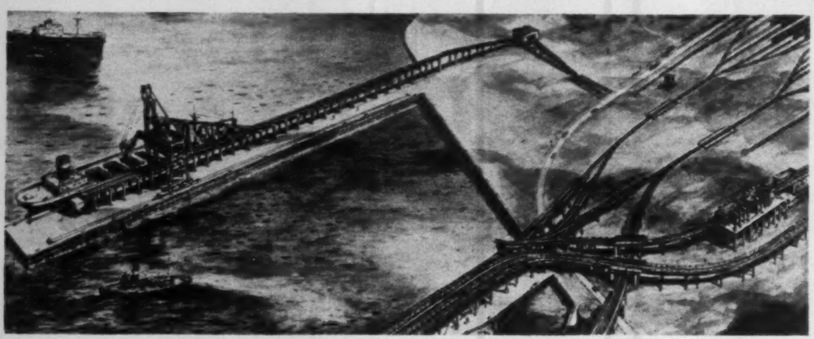
- Twice as much substandard housing as the national average.
- Highway development and civic improvement blocked by congested slums.
- City treasury subjected to a heavy drain by slums.
- Commerce and industry languishing because of outmoded streets, lack of central arteries and a lack of room for growth.

Norfolk got an allocation of 3,000 units of the federal government's initial total of 800,000 low rental units. The Authority broke ground in January, 1951 for the first project. Today the agency operates 17 projects containing over 5,700 low-rent units. And slum clearance has made land available under the federal urban renewal program for private and public buildings, streets and highways, parking areas and other non-residential purposes.

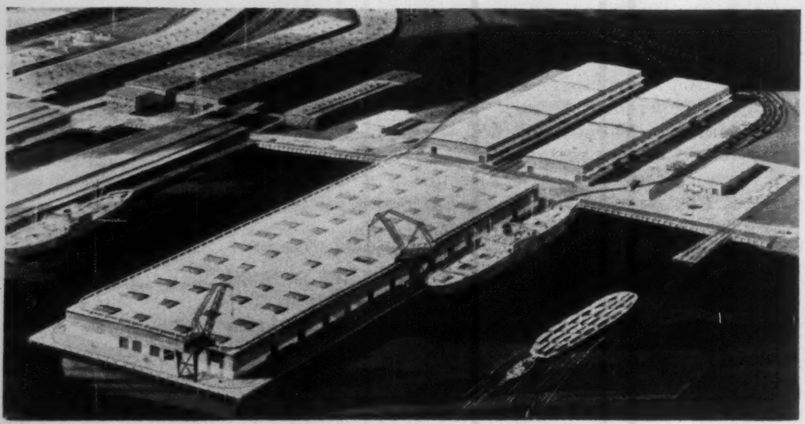
The Authority has encountered only slight opposition to its slum-clearance and redevelopment operations, virtually none at all from displaced families. The agency has practically eliminated hardship for relocated families by adhering to a requirement of the Virginia Housing Authorities Law, which stipulates that each redevelopment program



PORT EXPANSION due soon at Norfolk & Western Railway terminals includes a third N & W coal pier (broken lines at left, also sketch below) and a new Virginia State Ports Authority general cargo pier (right above and sketch below).



COAL PIER will cost N & W $19 million, will be able to load 10,000 tons per hour. Two existing piers loaded out 19.6 million tons last year.



GENERAL CARGO PIER will cost Virginia State Ports Authority $15 million, will add half million tons a year to port capacity. N & W will operate it as a public terminal.

include a relocation plan showing that the community can relocate the families affected at rentals they can afford.

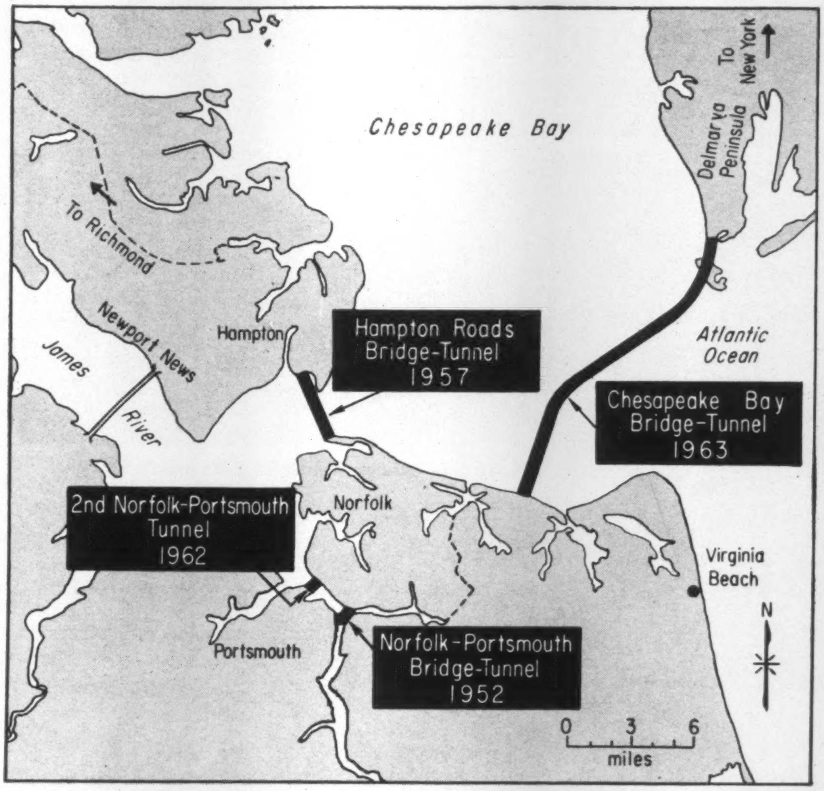
"Not one of these families was required to move until it had been offered a decent home within its means," says Mayor W. Fred Duckworth. "About one-third of the families moved to public housing and the remainder to private housing."

In practice, the Authority acquired vacant sites for its first projects and deferred demolition of slum structures for many months.

Although the housing projects are legally tax-exempt, they have proved less a tax burden than might have been supposed. The Housing Authority has made voluntary payments to the city of more than twice the amount of the tax previously yielded by the property involved.

Most impressive of Norfolk's federally aided urban renewal projects covers 165 acres of the oldest part of the city. Called the Downtown Redevelopment project, it is providing sites for a new civic center, hotel, office buildings, stores, major highways and a network of parking areas.

Downtown Norfolk will no longer be a dead end when the project is completed. Many narrow and congested streets will disappear from the map, including much of Main Street, whose honky-tonks, flophouses and brothels attained notoriety among sailors and



FOUR MAJOR CROSSINGS under construction or completed in the last 10 years are ending Norfolk's long isolation behind water barriers.

once earned the city a comparison to Singapore. Two major thoroughfares will carry traffic through the area—Waterfront Drive, a divided highway looping around the perimeter of the development and making an express link between two major existing arteries; and St. Pauls Boulevard, also divided, running right through the center of the project from an interchange with Waterfront Drive and connecting with another major artery.

To accommodate drivers with business downtown, the project includes off-street parking for about 7,000 cars, including 1,000 spaces along the river for all-day parking.

The Downtown project will have about 1¼ miles of covered pedestrian walkways. They will be about 15 ft wide and will probably be bordered with grass and shrubbery.

The civic center will cost $15 million and will comprise five major buildings: a 13-story municipal office building, 2-story municipal and police courts building, 8-story police headquarters and jail, courts of record building, and power plant and maintenance shops.

The project will also include a new 3-story library to replace one given to Norfolk by Andrew Carnegie in 1903, when the population was less than one-sixth what it is today.

The biggest completed structure in the downtown plan is the Golden Triangle Motor Hotel, a $6-million structure with a 13-story tower flanked by two 2-story wings. The hotel opened in June with more than 100 conventions already booked for the next two years.

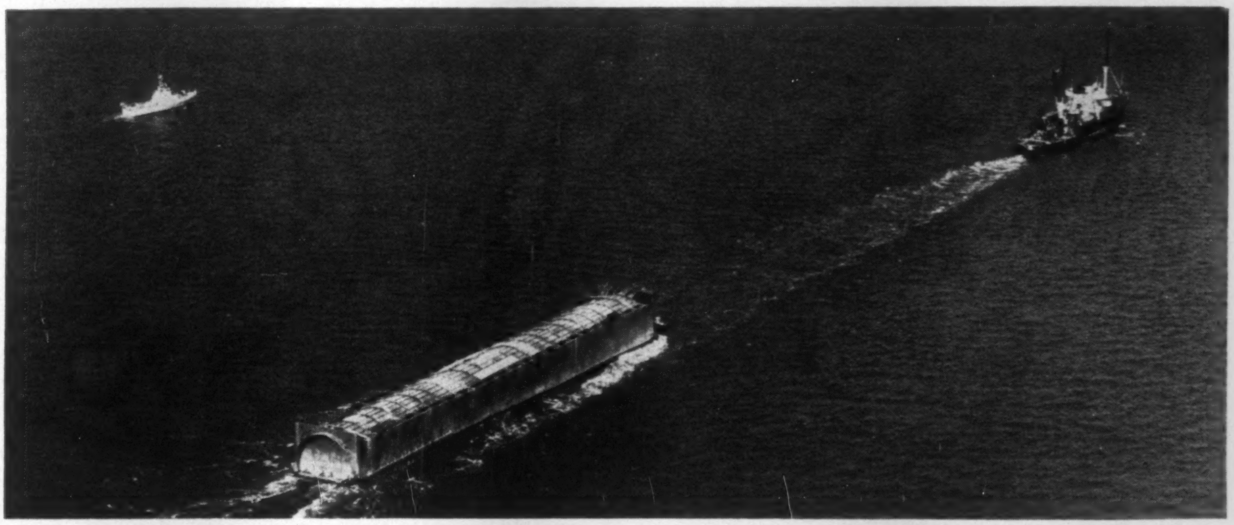
The Downtown project will cost $67.4 million total—$25.4 million for land, streets and parking; $15 million for the civic center; $27 million for private stores and offices.

- **Water crossings, the big hope**—Norfolk is something of a paradox in transportation. It is one of the country's busiest seaports, and it is served by eight railroads. Yet, until less than 10 years ago, it sat in peninsular isolation behind a formidable ring of water barriers crossed only by ferries.

Today the barriers are breaking down under the assault of a series of great construction efforts. And Norfolk pins its biggest hopes for future growth and prosperity on the outcome.

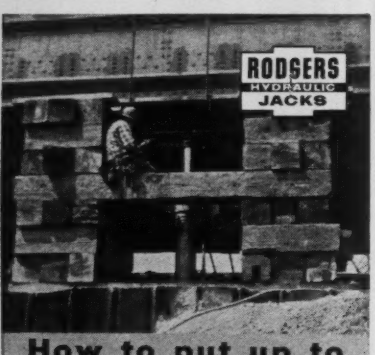
The first crack in the water curtain came in 1952, when the Norfolk-Portsmouth Bridge-Tunnel opened to traffic. It quickly took over all vehicular traffic between the two cities, and the 300-year-old ferry operation that had been the only means of direct connection went out of business.

The bridge-tunnel has been a phenomenal success financially. It carried the traffic volume in 1956 that had



TUBE 300 FT LONG will be part of 17.5-mile Chesapeake Bay Bridge-Tunnel. Sections are fabricated in Orange, Tex., towed to Norfolk and sunk in prepared trench on bay bottom. They are joined underwater.

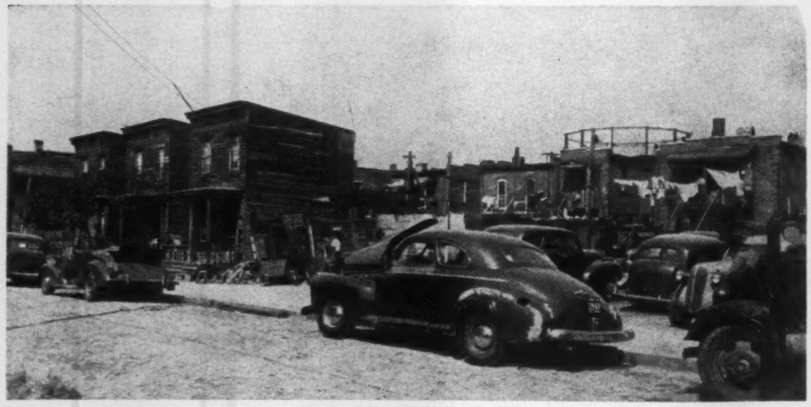
DON'T MISS
PAGES
52,53



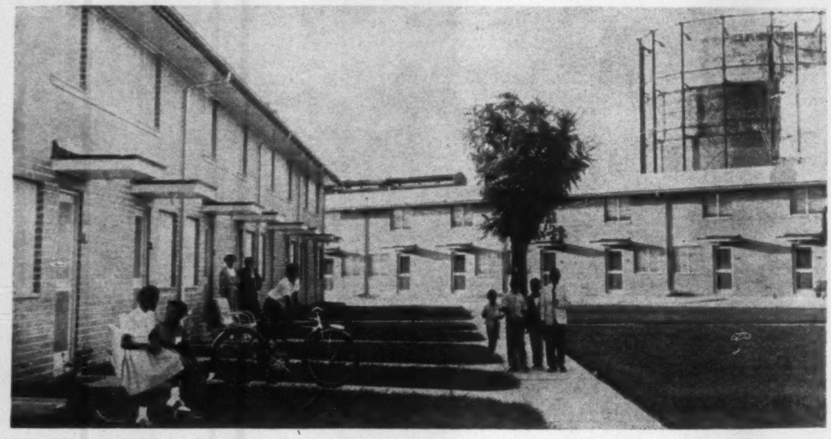
How to put up to
600 TONS OF FORCE
at your fingertips

RODGERS hydraulic jacks give you tons of brute-force for driving culvert or sewer casings . . . jacking heavy loads . . . leveling overhead forms . . . and countless other pushing, pressing, or pulling jobs. RODGERS offers you all types and sizes, 50 to 600 tons — manual or powered, single or double-acting. Use them singly or in groups. Prompt delivery. Write for detailed bulletin.
J-103D

RODGERS HYDRAULIC, INC.
Pioneer in high-pressure hydraulics, since 1932
7401 Walker St. • Minneapolis 26, Minn.



FROM THIS squalor around the downtown business district 10 years ago . . .



TO THIS neat low-rent development is achievement of slum clearance program.

been predicted for 1970. The commission retired the original bonds last year, 20 years ahead of maturity, and started work on a new tunnel.

The bridge-tunnel serves commuters primarily. Surveys show that 84% of all trips through it begin and end in the Norfolk-Portsmouth metropolitan area. It links downtown Norfolk to the Berkley section of Norfolk by a bridge over the Eastern Branch of the Elizabeth River, and Berkley to Portsmouth by a tunnel under the Southern Branch.

Total length, including approaches, is 1¾ miles. The bridge is 2,160 ft long, including a 178-ft bascule span. It carries four lanes of traffic. The project cost $23 million.

The new Norfolk-Portsmouth tunnel is under construction about two miles from the first, under the main channel of the Elizabeth River. It will have an over-all length of 5,400 ft, including approaches. Portal to portal it will be 4,200 ft long. Like the first, it will carry two lanes of traffic. It is scheduled to open in 1962.

The new tunnel will cost about $25 million. The commission floated a $41.7-million bond issue last year to finance it and to retire the last of the outstanding bonds of the first tunnel.

The second big water barrier to fall was Hampton Roads, the harbor formed by the juncture of the Elizabeth, James and Nansemond Rivers and Chesapeake Bay. Hampton Roads Bridge-Tunnel opened to traffic in 1957, replacing the ferries and giving Norfolk a faster and more direct connection to Hampton, Newport News, Williamsburg and Richmond.

The Hampton Roads crossing was a tremendous engineering feat. The builders made two islands by dredging and compacting soil, connected them with a 6,900-ft underwater tube section, and built 10,000 ft of trestle to connect the islands to land at either end. The project cost $60.5 million.

Now the biggest barrier of all, Chesapeake Bay, is under attack. Construction has begun on a $200-million, 17.5-mile bridge-tunnel across its mouth.

More than other single development, the bay crossing is Norfolk's bright hope for economic vigor and growth. Chesapeake Bay cuts deeply into the U.S. East Coast, angling northward 175 miles into Maryland and Delaware. It shunts north-south traffic inland far to the north and south of Norfolk. It puts several thousand square miles of Virginia, Maryland and Delaware—the Eastern Shore—into a quiet deadend pocket with no link to Norfolk except a long ferry ride. It makes Norfolk a cul-de-sac for coastwise movement by land. And it deprives the city of much of the commerce it covets.

Norfolk hopes fondly that the Chesapeake Bay Bridge-Tunnel will change all that and put the city "in the center of Main Street from Boston to Miami."

Traffic forecasts support optimism. The bridge-tunnel crossing will take 22 to 25 minutes in contrast to 85 for the ferry. Engineers estimate that the new route will cut 1½ hours off the driving time from New York to Jacksonville via the Ocean Hiway, of which the new crossing will be made a part. The bridge-tunnel is expected to cary more than 5,000 vehicles a day during its first year and nearly twice as many by 1978. The ferries carry less than 2,000 a day.

The new crossing will carry two lanes of traffic. It will be adequate for the heaviest trucks. Major elements of the facility will include two underwater tube sections, each a little more than a mile long; four man-made islands at the tube portals; two high level bridges, 1,356 ft and 3,795 ft long; 12 miles of low-level trestle; about five miles of new approach highways; and 9,000 ft of causeway across a natural island.

The tunnels—like those under the Elizabeth River and Hampton Roads—will be constructed by the trench method. Prefabricated tube sections 300 ft long will be floated to the site, sunk into trenches prepared on the bottom, and then joined underwater.

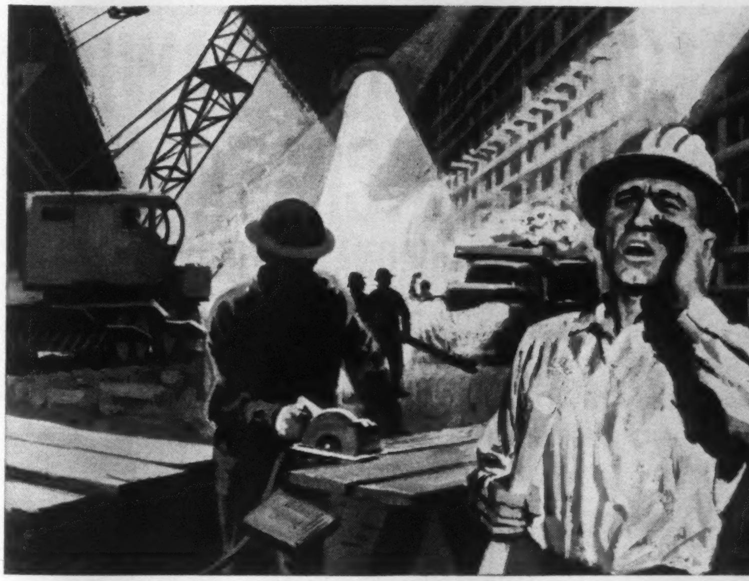
The crossing will be operated by the Chesapeake Bay Bridge and Tunnel Commission, a state-created authority, formerly named the Chesapeake Bay Ferry Commission. The agency presently operates the ferries.

The Commission floated a $200-million revenue bond issue last year to finance the new bridge-tunnel.

• **Courtship of industry**—Norfolk has always been a Navy and seafaring town—never a manufacturing center. But like many another city in the southern states, seeing industry as a key component of prosperity, Norfolk has set its cap to attract manufacturers—and has scored initial successes.

The city makes one of its biggest efforts to lure industry through the Tidewater Virginia Development Council (TVDC). This promotional and service organization represents Norfolk and 17 other political subdivisions in the area. TVDC spends about $200,000 a year—half on newspaper and business-magazine advertising (WALL STREET JOURNAL and BUSINESS WEEK, for example) and other promotion and the other half on engineering and research.

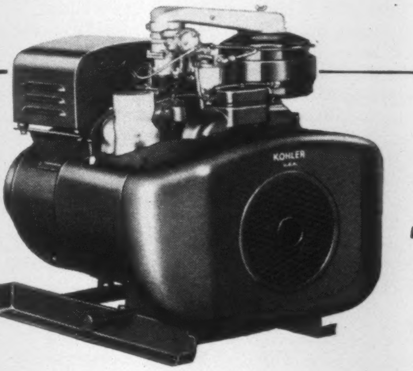
(*Please turn the page*)



KOHLER ELECTRIC PLANTS

Independent power with stamina—cost-saving reliability

On the job at dam, bridge, turnpike, seaway and building construction—major projects of all kinds—Kohler electric plants are staunchly dependable under any conditions... Engineered for rugged, round-the-clock endurance wherever needed for floodlights and power tools, or on cranes and service trucks, they contribute smooth-running efficiency that saves time and money... Quick-starting in all weather, economical to operate, easy to maintain... Sizes to 115 KW, gasoline and Diesel. Write for folder K-40. See us in Sweet's Catalog.



KOHLER CO.
Established 1873
KOHLER, WIS.

MODEL 5RM61, *5000 watts,*
115/230 volt AC.
Remote start.

KOHLER OF KOHLER

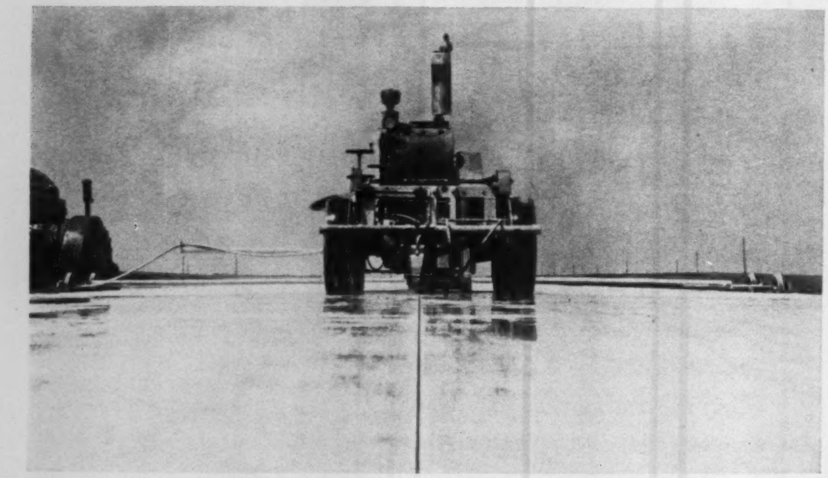
ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS
ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

DIAMOND BLADE SAWING OF CONCRETE

Case Report: CORONA, CALIFORNIA

COST-$.09 per linear foot

TYPE OF WORK—Concrete Highway
AGGREGATE—Gravel
SAWING OPERATION—Diamond blades for all sawing
TYPE OF DIAMOND—Engelhard Hanovia SND-MB diamond abrasive.
DIMENSIONS—Longitudinal and transverse 2" x 1/8". Transverse joints sawed at 4° angles—on 15 ft. centers.
PRODUCTION—Longitudinal joints up to 4500 l/f per day.



The savings made possible by modern diamond blade sawing in initial highway construction are significant—but not nearly so important as its effect on maintenance. Diamond blade sawing produces the *only* joint that has proved reduction in maintenance costs—by as much as 50%! In California for example, where sawed joints are specified for all new highway construction, there is an 80-20 ratio between new construction and maintenance expenditures.

Diamond blade sawing maintains maximum concrete strength and homogeneity in the joint areas because *material is removed,* not displaced, eliminating the basic cause of spalling, cracking and chipping. Cuts are precise, with uniform highway and runway joints provided by high-speed, semi-automatic procedures that neither interfere with nor delay the actual paving operation, saving time and labor costs.

* * * *

For detailed information and field-use reports from state highway officials and contractors, write to Engelhard Hanovia, Inc., for Report #101.

Engelhard Hanovia, Inc. is the leading supplier of SND-MB diamond abrasive, a result of research that has greatly increased diamond cutting efficiency, to diamond blade manufacturers

★ENGELHARD HANOVIA, INC.★
INDUSTRIAL DIAMOND DIVISION
113 ASTOR STREET · NEWARK 2, NEW JERSEY

The group follows no set pattern in selling a manufacturer. Its staff includes industrial engineers and market-research personnel to help interested firms estimate what and how they would do if they relocated. One approach used successfully by a town and county jointly was to finance the building needed by a manufacturer. The Council urges its other constituents to consider this method too.

TVDC points to a number of successful persuasions so far. It believes, however, that the program is still too new to make its full impact.

Besides the joint effort, Norfolk makes a strong individual bid for migrating industry. The city razed a World War II temporary housing development to make room for a 400-acre industrial park on a site where utilities and transportation are convenient. The park is reserved for industries moving into the city from outside. So far three food chains have moved in with $7.5 million worth of warehousing and distribution facilities, and a power mower manufacturer from Buffalo, N. Y., has relocated in the park.

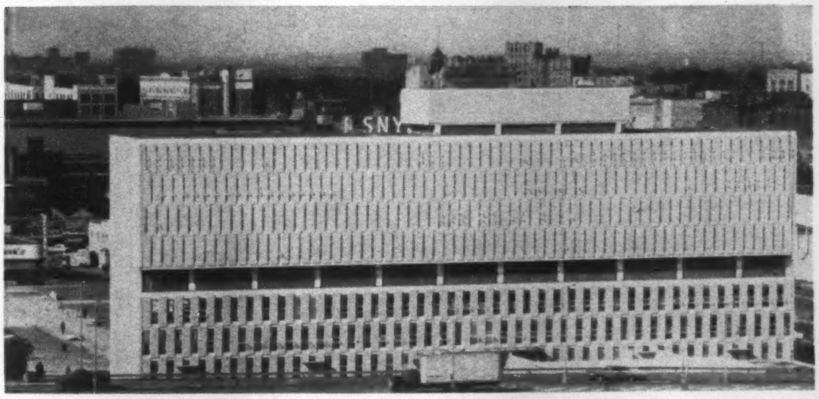
The city administration has private backing in its official eagerness to grow industrially. Virginia Electric & Power Co., whose stake is obvious, also carries on a promotional and advertising campaign directed at out-of-state manufacturers. The utility's comparative power-consumption figures show the great room for industrial growth. Since 1950, residential and commercial consumption of electricity have more than tripled while industrial consumption has increased only one-third.

• Port is big, growing—Thanks to coal, Norfolk ranks among the country's top ports in tonnage. In fact, the ports of Hampton Roads shipped a greater total tonnage of all goods including coal than any other port in the U. S. one year (1958). But this is not enough. Expansion of both coal and general cargo capacity is about to get under way with construction of $34 million worth of new facilities. And Virginia has embarked on a port subsidy program aimed at putting and keeping its ports in better competitive form.

The coal business belongs to Norfolk's principal railroad, the Norfolk & Western. From West Virginia, Virginia and Kentucky, the N&W moved 19.6 million tons of coal through its Norfolk piers last year. And the quantity is going up.

Japan, in the throes of an economic boom, took 5¼ million tons last year. To stoke her exploding steel industry, she expects to increase the quantity to 7 million tons this year, 9 million tons by 1965 and 14 million tons by 1970, according to Stuart T. Saunders, N&W president.

DOWNTOWN REDEVELOPMENT made room for $6-million Golden Triangle Motor Hotel. Tower has three floors of office space. Two-story motel wings extend rearward.



CIVIC CENTER STARTED with new $4.25-million Public Safety Building. Four other buildings will bring total cost to $15 million.

MARITIME TOWER, a new landmark downtown, rose on urban renewal site. It contains a department store, 750-car garage and eight floors of office space.

Germany, another big customer with a rapidly expanding economy, has increased her import quota by 13½% for this year and next.

The N&W has announced plans to build a third coal pier at Norfolk at a cost of $19 million to handle the added tonnage. It will be capable of dumping coal at a peak rate of 10,000 tons per hour and will accommodate colliers now under construction or planned with a capacity of 35,000 to 50,000 tons.

When the new pier is completed and the supporting facilities enlarged, the N&W will be able to dump 1,800 cars a day at Norfolk, and store 11,175 cars in its Norfolk yards.

The N&W also owns and operates general merchandise piers in Norfolk,

Proved Cost Saver

CURE and SEAL CONCRETE WITH 1 PRODUCT

THOMPSON'S WATER SEAL

Eliminates wet sacks, papers, hosing and spraying

Spray deep penetrating, colorless Thompson's Water Seal on fresh concrete to cure and seal in one operation. Save time . . . save labor.

Effectively controls moisture loss for 28 days and beyond.

Assures uniform curing even in hot, dry weather.

Helps reduce checking, cracking, spalling.

Produces harder, dust-free surface.

Eliminates waterproofing concrete floors.

Permits adequate time for smooth troweling.

Send for technical bulletin and Contractors Case History file.

A proved bond breaker for pre-cast, tilt up and lift slab construction. Permits easy, clean separation of slabs, walls, pre-cast members.

Available in 5 and 55 gallon drums from building supply stores, paint and hardware dealers.

4932

Thompson's

MANUFACTURERS OF FINE PROTECTIVE CHEMICALS SINCE 1929

E. A. Thompson Co., Inc., Merchandise Mart,
San Francisco 3, California

San Francisco • Los Angeles • San Diego • Portland • Chicago • Seattle • Denver • Dallas Houston • St. Louis • St. Paul • Detroit • Philadelphia • New York City • Memphis • Cleveland • Factory: King City, California

IT'S A FACT

Longyear help in site exploration or geological surveying is available anywhere . . .

Whether it's a bridge, dam, road, building or mineral venture, take advantage of our respected 70 years experience in geological and mining consultation. Longyear experts can save you money and difficulty in locating good foundation sites, mineral sources or access routes.

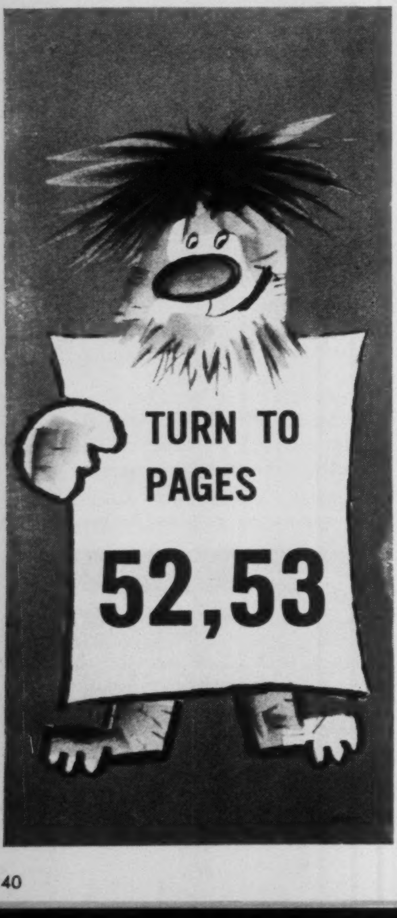
For more information, contact our nearest office.

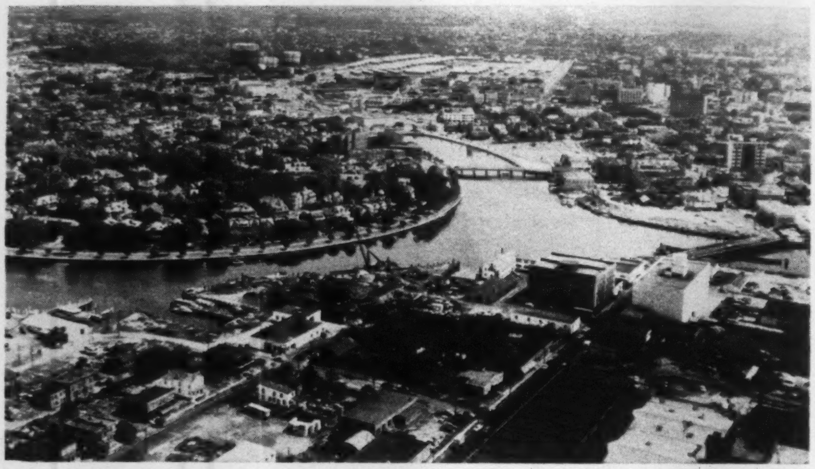
Longyear

E. J. LONGYEAR CO.
Minneapolis, Minn.
Tel: FE 9-7631 Cable: LONGCO

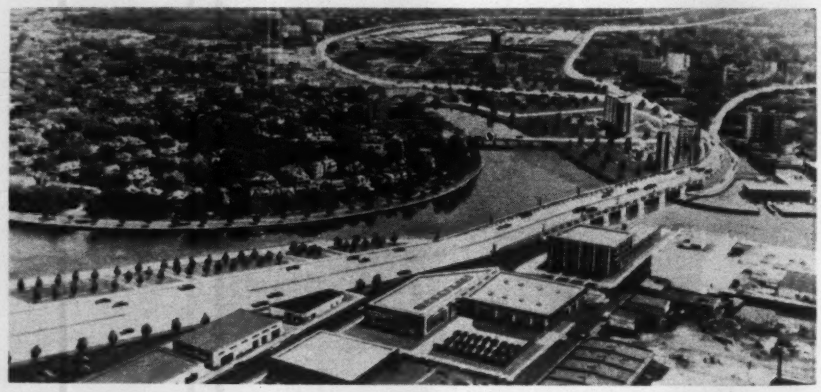
E. J. Longyear Co.
Salt Lake City, Utah

Longyear N. V.
The Hague, Holland





BEFORE: A blighted area of 135 acres stagnates in Norfolk's Atlantic City district.



AFTER: Sketched changes include major vehicular routes, new parks and buildings.

but the Virginia State Ports Authority has contracted to buy them as the first move in a long-range program to improve the competitive position of the ports.

The state's present stake in port prosperity is about $18 million a year in taxes and $150-200 million a year in wages for its citizens.

According to Rear Adm. D. H. Clark (USN, ret.), executive director of the Ports Authority, the state had to take action or see the ports deteriorate because subsidized competition from other East Coast and Gulf ports force general cargo terminals in Virginia to lose money.

The Authority will pay N&W $12 million for the line's five general cargo piers plus warehouses and other supporting facilities, then lease them back to the railroad for operation as public terminals. The agency has also announced plans to expand the terminal with a new $15-million pier, also to be leased to the carrier. The new pier, with 360,000 sq ft of covered storage space, 100,000 cu ft of cold storage and two 90,000-sq ft warehouses, will boost Norfolk's general cargo terminal capacity by 500,000 tons a year.

Under the purchase and lease plan, the Authority will sell revenue bonds (possibly this fall) to finance the purchase; lease the terminals to the carrier for half the cost of servicing and retiring the bonds; and depend on the state assembly every session for the other half. The carrier will operate and maintain the terminals.

The Authority hopes to make other arrangements like this. It is presently considering a sale offer from the Atlantic Coast Line Railroad for general cargo terminals in Portsmouth, and it contemplates buying the Chesapeake & Ohio general cargo terminals in Newport News.

Another bright spot in the future of Norfolk shipping is N&W expansion. The line merged in 1959 with the Virginian Railway, primarily a coal carrier, and now proposes to merge with the Nickel Plate Road and lease the Wabash Railway. This would extend the N&W system into the Midwest and Great Lakes areas with lines handling almost exclusively freight.

N&W President Saunders says his road is already handling more freight at its Norfolk terminals as a result of the Virginian merger and expects still further increases after the Nickel Plate and Wabash lines join the system.

“...We get longer life from Armco Dredge Pipe”

New steels are born at Armco

To widen the Louisville-Portland Canal, near Louisville, Kentucky, dredge in background hydraulically removes sand, silt and rock through the Armco Dredge Pipe mounted on pontoons.

For strength,
economy,
durability

Steel

“Experience has proved that we get longer life from Armco Dredge Pipe, giving us more yardage at less cost,” said Dunbar & Sullivan Dredging Co. of Detroit, who used Armco Dredge Pipe to handle 2½ million cubic yards of material in widening the Louisville-Portland Canal.

Dunbar & Sullivan utilized 1000 feet of 22-inch I.D. Armco Pontoon Dredge Pipe in 40- and 80-foot lengths. Pipe wall thickness was .438-inch. Ball joint fittings were welded to the pipe at the Armco plant.

Armco Dredge Pipe is made of a special steel, developed to withstand abrasive materials and rough service. It is supplied with various mill-fabricated fittings for dredging service. Write for informative folder. **Armco Drainage & Metal Products, Inc., subsidiary of Armco Steel Corporation, 6671 Curtis Street, Middletown, Ohio.**

ARMCO Drainage & Metal Products

▲

In the first month, 265,720 yds

were moved by Halvorson's 7 B 'Pulls*. 284,526 yds in the second month — working two 8-hr shifts a day. And, a month later, General Foreman Carl A. Storlie reported, *"We are finishing in 3 weeks more, moving 1 million yards on schedule with our 7 LeTourneau-Westinghouse Model B Tournapulls!"*

Haul up grade all the way — ▶

Working over 7,000-ft cycles, the B 'Pulls loaded in canyon-bottom, hauled 3,000 ft — *up 7 to 9% grade* — to dump-area. Each scraper averaged 800 yds per 8-hr shift. Notice smooth, fast-travel condition of haul road, maintained by grader. Only other machines on the job: 3 push tractors.

LW

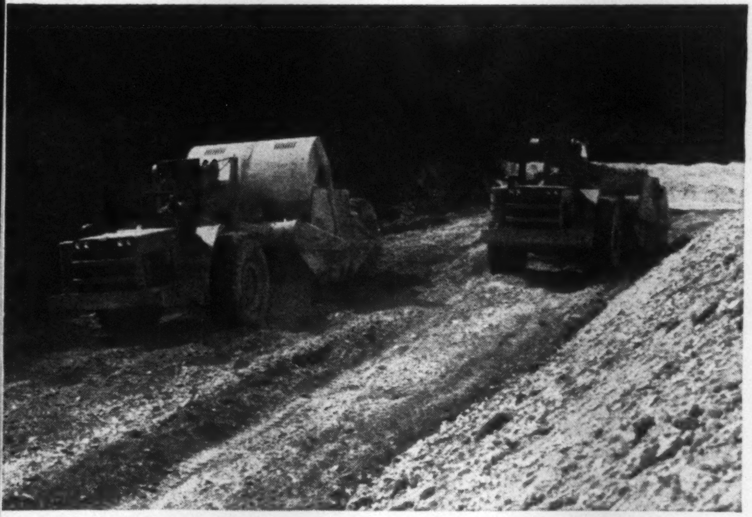
LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

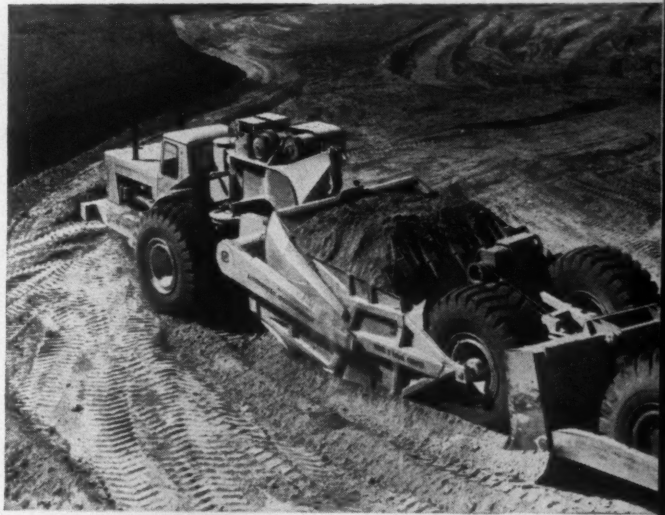
1,000,000 cu yds to move in 16 weeks

That was the schedule tackled by Carl M. Halvorson, Inc., Portland, Oregon, contracting firm. The job: stripping one million cu yds of clay and rocky overburden at Lompoc, California — uncovering diatomaceous deposits for a commercial processing plant. To meet the tight, 16-week production deadline, Halvorson moved in 7 big B Tournapulls®. How did these LeTourneau-Westinghouse scrapers make out? Pictures and captions tell the story!



Dumping into ravine —

Confined dump area in deep ravine didn't slow down production cycles of these big, maneuverable Tournapull-Scrapers. They spread smooth and fast, on the run. Halvorson's "B's" are "veteran" performers. Average age of these LeTourneau-Westinghouse machines is 3 years. During that time, they've turned in big-yardage performance on dam and highway jobs in Washington and Oregon.



Better than ever —

Tournapull's positive-traction power-transfer differential, kingpin power-steer, electric controls all played an important part in completing Halvorson's 1,000,000-yard job on schedule. These same LW advantages are incorporated in today's bigger, more powerful V-Power "B" — 430 hp, 29 heaped-yd capacity (58 yds in tandem). It's shown above — *your best bet for big scraper profits!* Ask for details

Epoxies

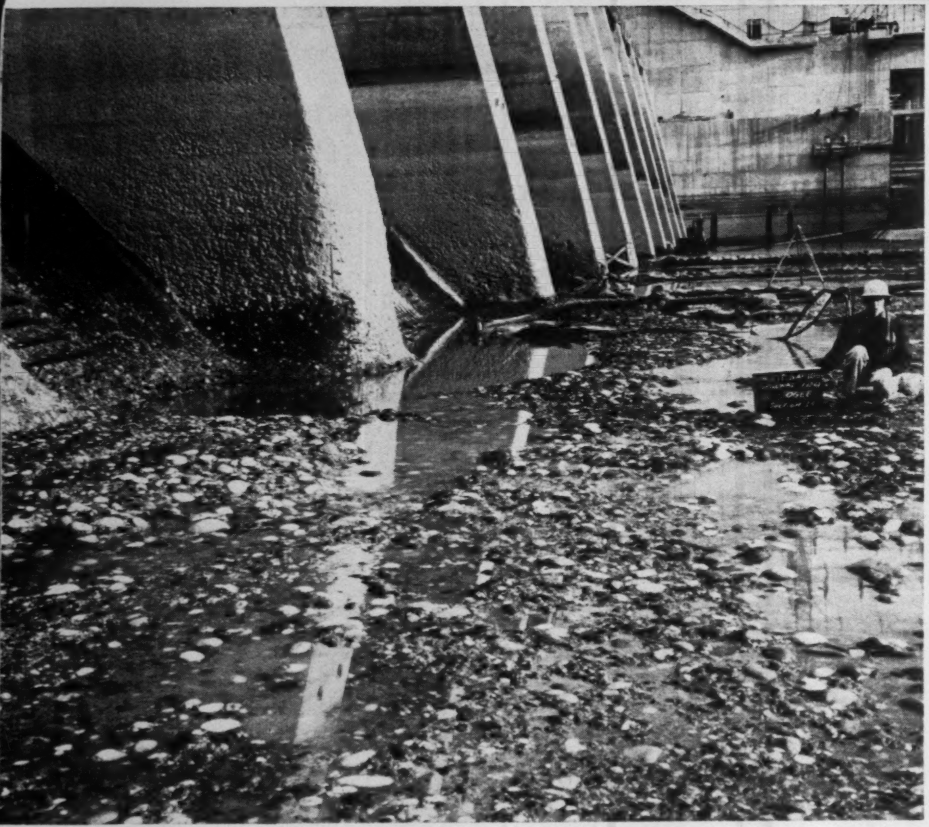
Epoxy resin helped bond new concrete to old on two unfinished Columbia River Dams—Rocky Reach and Priest Rapids—damaged by erosion.

At Rocky Reach concrete eroded at the base of 11 of 12 spillway bays. Apparently, river flows diverted through the spillway bays while they were still 40 ft below their final elevations, caused the damage. The lower structure allowed large rocks to pass into the bucket and grind away at the concrete. Erosion exposed reinforcing bars and bared aggregate.

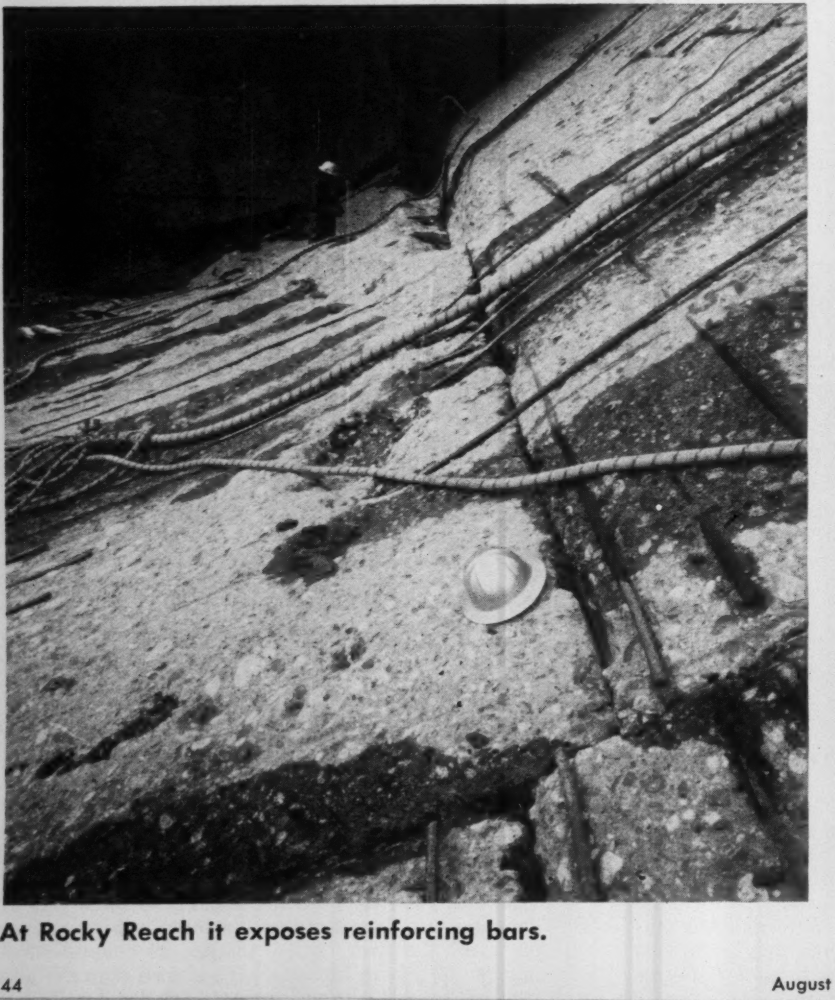
Damage at Priest Rapids was similar to that at Rocky Reach. It involved the 900 x 80 ft apron at the base of the spillway section and the lower portion of the spillway ogee.

Repairs at both dams involved sand blasting the eroded areas, applying the epoxy coat and then applying a layer of concrete.

Because temperatures were down in



At Priest Rapids erosion bares aggregate . . .



At Rocky Reach it exposes reinforcing bars.

To repair damage, workmen prepare

Bond Concrete to Repair New Dams

the 20s, tarpaulins covered work areas. Space heaters raised the temperature to around 50 F to assure curing of the resin.

Of the 12 fifty-foot-wide bays at Rocky Reach, erosion attacked 11 in varying degrees. Erosion in Bays 4-12 (those given the epoxy-concrete treatment) was least severe. Although some pockets were several feet deep, erosion had mostly bared aggregate and reinforcing bars.

Bay 1, brought to full 135-ft height in 1959, apparently went undamaged. Severe damage appeared in Bays 2 and 3. In these bays, pockets as deep as 6 ft had to be filled with concrete, after considerable chipping to assure bonding.

At Priest Rapids, erosion attacked all 22 bays in the 900 x 80-ft apron and the lower 18 ft of the spillway ogee. About 35% of the spillway bucket was involved. Gravel and rocks had pounded eleven bays since 1958. The other eleven were operating since 1959.

Four hundred gallons of resin went into Rocky Reach repairs. Two men applied the epoxy coat with scrub brushes. Concreting began about 45 minutes later.

By using the epoxy coat, they could keep the thickness of some new concrete down to about 2 in., much less than they would have attempted without the resin. Maximum concrete thickness was 6 in.

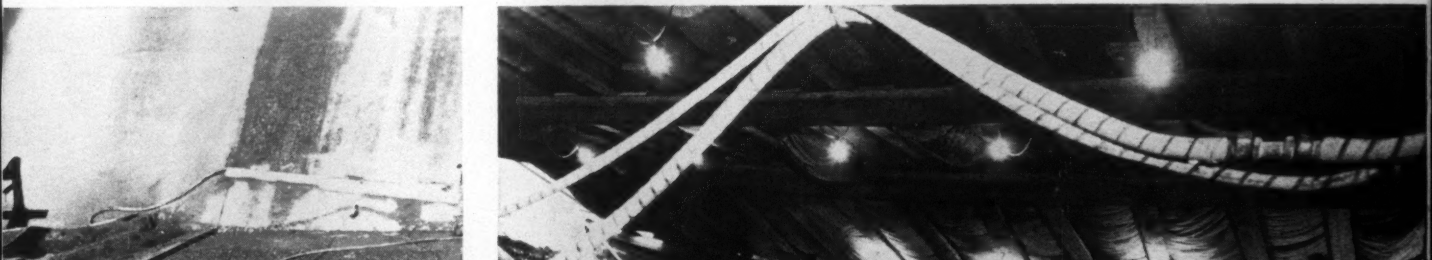
At Rocky Reach, the contractor used a dry 7½-bag concrete mix, with 1¼-in. maximum slump. It was water cured for three days.

The Priest Rapids repairs took about 1,050 gallons of epoxy resin. At first, a spray rig applied the resin coat. It worked satisfactorily until a job accident put it out of commission. Men with long-handled wallpaper brushes applied the remainder of the resin. Concreting, with a maximum thickness of 16 in. followed.

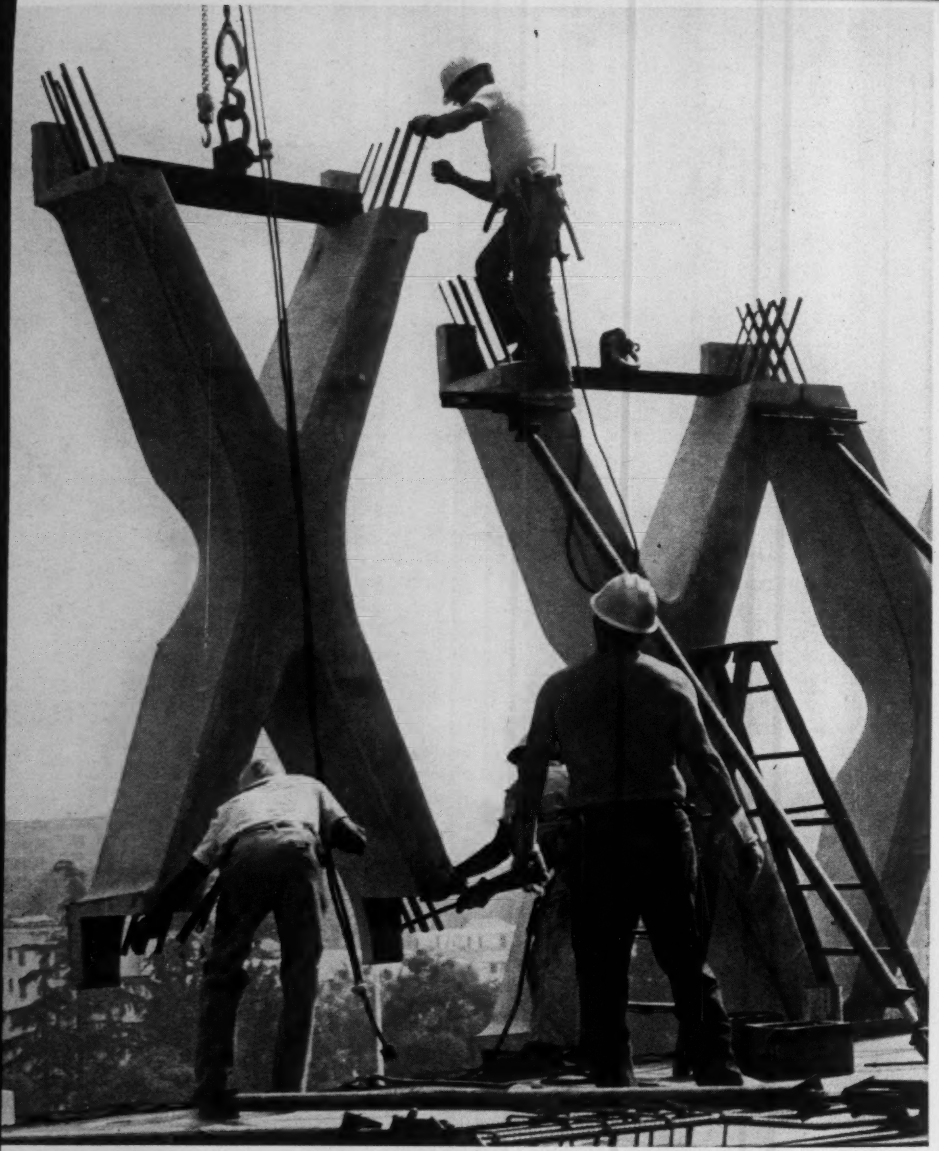
Merritt-Chapman & Scott holds the $92-million contract at Priest Rapids. Harza Engineering Co. designed the project and supervises construction. Completion date is sometime late this year.

Rocky Reach Dam Builders—a combine of L. E. Dixon, Hunkin-Conkey, Arundel and American Pipe and Construction—handled first stage construction at Rocky Reach. A new combine, called Rocky Reach Contractors—the above four plus Guy F. Atkinson Co.—took over second-stage construction. Stone & Webster Engineering Corp. of Boston, Mass., designed Rocky Reach and supervised construction.

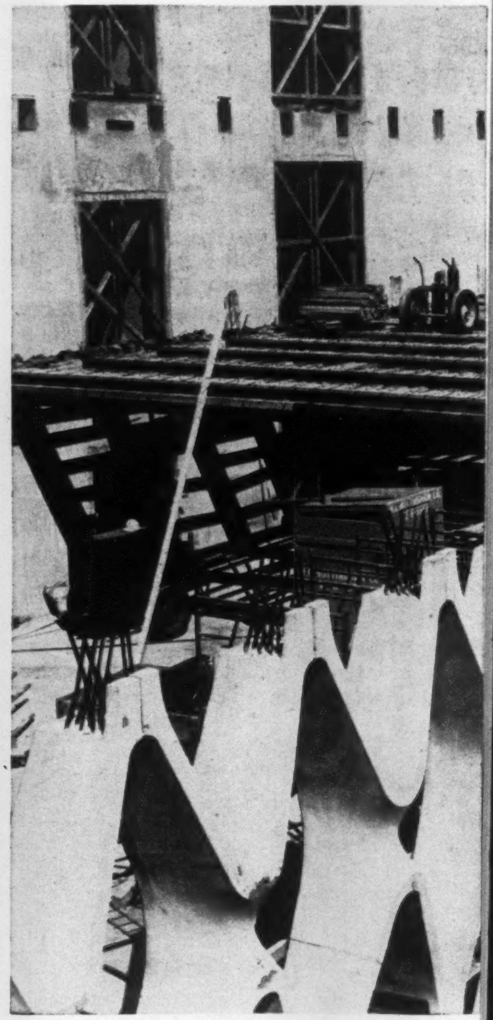
The $262-million Rocky Reach Dam project should be in full operation by November 1 this year. The first of seven generators in the 750,000-kw line began delivering power in June.



surface for epoxy and concrete coats applied in tarp-covered, space-heated work areas.



Precast, reinforced concrete X's unite to form a grill.



The grill and a concrete core

Decorative Concrete Grillwork

By James Kesler and Albert Salibian

The headquarters of the American Cement Corp., now near completion on Los Angeles' Wilshire Boulevard is a showcase for dramatic uses of concrete.

The building, 14 stories high, has a nine-story tower rising from a four-story base structure. The most striking aspect is a concrete grill that covers the two wider sides of the tower.

Although the grill from a distance appears to be a delicate facade of masonry lacework, it is no mere decorative detail. It is a structural component of the building that resists both vertical and lateral loads.

The use of handsome reinforced concrete grill work for both decorative and structural purposes typifies the approach to the project of the designers, Daniel, Mann, Johnson & Mendenhall, Los Angeles architects-engineers (ENR Feb. 11, 1960, p. 53). Their aim was to exploit to the fullest extent the structural properties and the esthetic potential of reinforced concrete.

Other design criteria that guided DMJM were:

- Provide column-free office space.
- Satisfy earthquake codes thoroughly, preferably with concrete shear walls or diagonal bracing.
- Make costs competitive with structural systems and materials other than concrete.

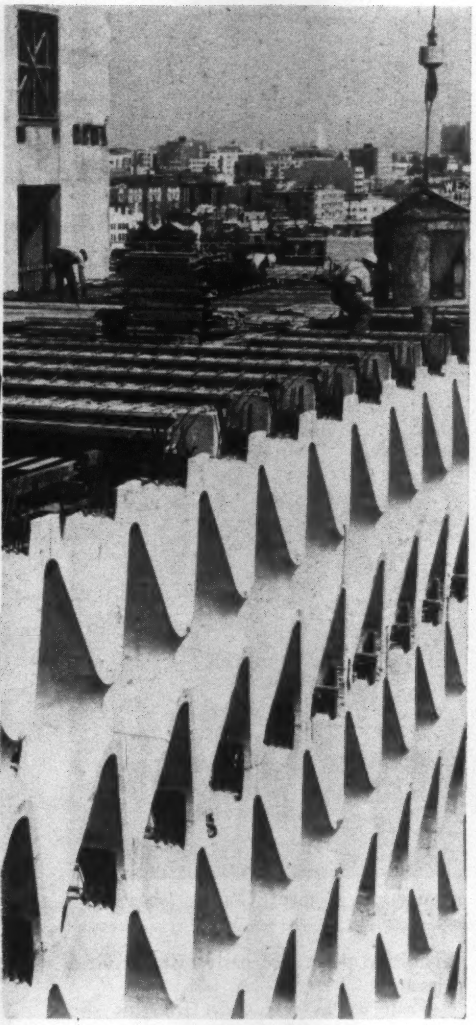
The structure that DMJM produced is a two-unit building, a base devoted to parking, shops, a lobby and executive offices; and a tower devoted to office space.

The base, which extends over the entire site, has four parking levels, one of them below grade. Columns and a central service core carry its beam-and-girder, concrete floors. Shear walls add lateral support for the columns. A precast, nonstrucural grill covers two sides of the base structure and a folded-plate concrete roof covers much of it.

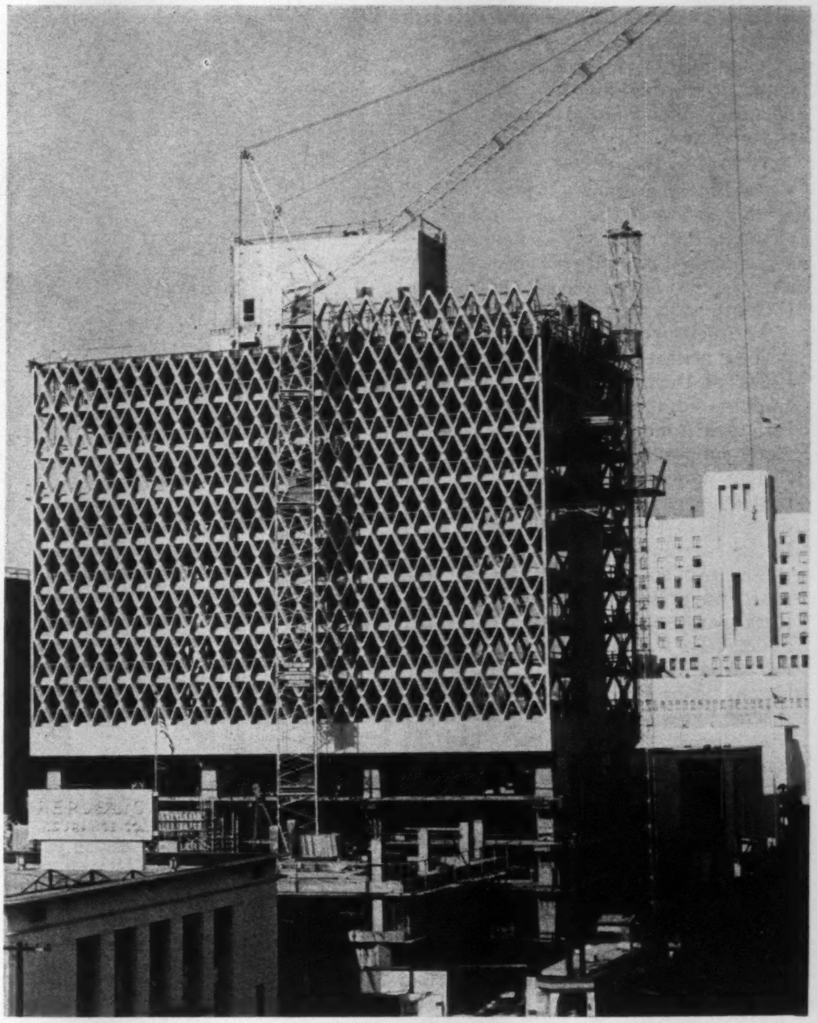
The tower, which offers 12,000 sq ft of column-free office space on each floor, is as wide as the base but considerably narrower and stands flush with

---

JAMES KESLER and ALBERT SALIBIAN are chief structural engineer and project structural engineer for Daniel, Mann, Johnson & Mendenhall, architects and engineers of Los Angeles. They were responsible for structural design of this unique concrete building.



support precast floorbeams.



Deep girders below the grill transfer the tower load to columns.

Doubles as Load-Bearing Wall

one side of the base. The concrete service core, extending through the center of the tower, houses elevators, stairs and utilities and acts as a load-bearing and shear-resisting element.

The grill, which replaces the usual beam-and-column system on the north and south sides of the building, is made up of 225 X-shaped, precast concrete units placed in front of the windows. Each X stands 11 ft 9 in. high and weighs 4,000 lb.

Developed by DMJM Partner Phillip J. Daniel, the grill offers resistance to lateral loads and since it is not subject to bending, it does this with a minimum of concrete.

The grill also will cut air-conditioning costs by acting as a sunshade. It is expected to be practically maintenance-free.

• **Underneath it all**—Drilled and belled caissons founded on firm, impermeable soil support the American Cement Building. Eleven concrete pitted caissons averaged 7 ft in diameter and belled to as much as 23 ft, carry the tower part of the building. However, the central core of the tower imposes a heavy load for its comparatively small size and there wasn't room enough under it to install belled caissons economically; so the builder used a deep mat foundation.

Smaller caissons support the rest of the base structure, which also has continuous footings under its walls.

High groundwater in the area, which restricted the basement to a single level, was no problem, once the excavation was dewatered. The contractor, Peter Kiewit Sons' Co., Omaha, was able to machine-excavate most of the caissons.

• **Building the base**—Conventional cast-in-place concrete beams and girders make up the base structure. Most of the beams span 42 ft. Concrete shear walls provide lateral rigidity. These walls are also designed to resist lateral loads acting on the tower.

Because the American Cement Building stands on a corner site, the two walls of the base that face adjoining property are solid concrete walls that for ease of construction were made of precast concrete panels. Slip-joints at the tops of these panels prevent resistance to lateral loads. The purpose of this type of joint is to avoid eccentricity between the center of the mass of the base and its center of rigidity for lateral force resistance.

A precast concrete grill that, unlike the tower grill, has no structural responsibility, covers the two sides of the base that face the street. This grill serves as an architectural feature for the lower floors of the building and its large air openings offer natural ventilation for parking areas.

• **Building transition**—DMJM thought of the base and the tower as separate elements that needed to be mated. They accomplished this with a transition floor, a mechanical floor between the base and the fifth story of the tower.

The depth of the transition floor is devoted entirely to concrete girders. Eight of them, paired to make what amounts to four box girders, support two main longitudinal girders that directly support the two grill walls.

The longitudinal girders are supported by transverse girders that are designed to transmit upper floor loads to the columns.

The two box girders at the east and west end of the tower support 12-in.-thick transverse shear walls. These box girders have walls from 8 to 20 in. thick, top slabs from 6 to 15 in. thick, and bottom slabs from 6 to 20 in. thick.

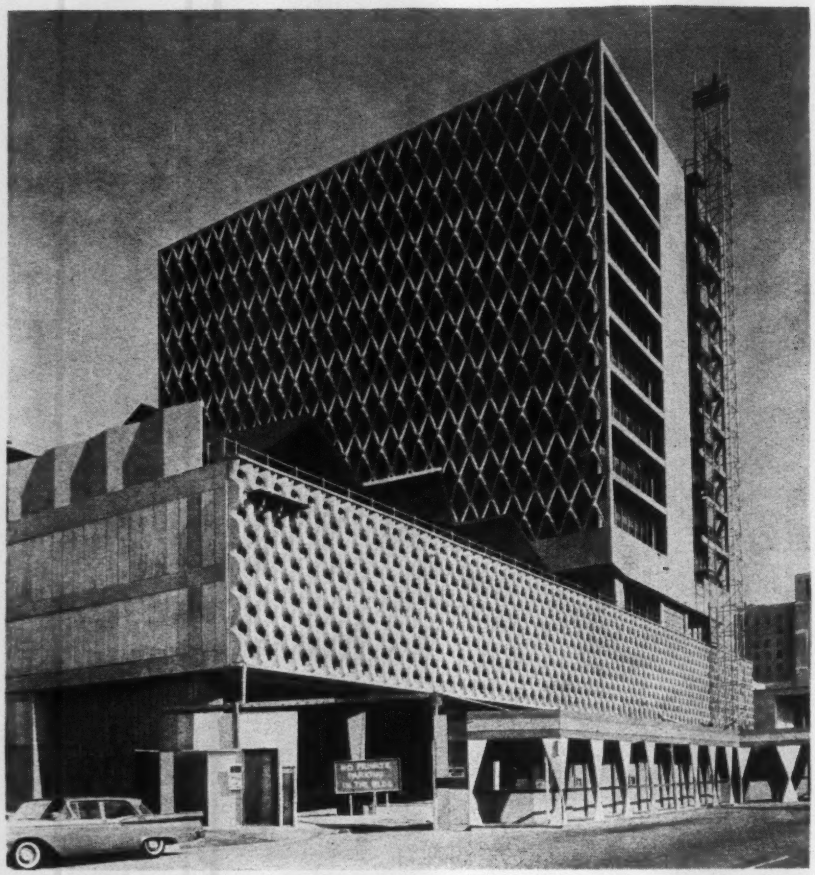
The two box girders at the central core each support a pair of 8-in.-thick transverse shear walls that enclose the stairways. These girders have thicker walls—from 8 to 33 in. thick. Top slab is 6 in. thick while the bottom slab ranges from 6 to 20 in. thick.

Shear walls and girders are in the form of a large, inverted T supported at its extremity by two large concrete columns extending to the foundations. The overturning forces on these shear walls are distributed to the largest possible base. Additional walls stiffen the columns below the south floor level. This technique made effective use of concrete shear walls that were considered too narrow for extension from ground to top of building.

The full (8-ft) depth of the transition floor was used to handle the heavy loads involved in the transition. This story also provides space for air-conditioning equipment in a central location, allowing air distribution to be split up and down from the fan rooms.

The fourth-floor level is the only place where lateral loads are not resisted by concrete shear walls or by the bracing action of the bearing grill. Here, eight main columns resist all of the transverse lateral loads of the tower. A relatively flexible frame thus couples a rigid tower to a rigid base.

To guard against excessive strain during severe earthquakes, DMJM designed the coupling frame at the fourth floor to withstand more than the usual seismic load. All shear loads were resisted by reinforcing steel to improve the energy absorbing characteristics of the frame.



WINDOWS BACK UP the concrete grill of American Cement Corp.'s "showplace." Facade of the parking annex is non-load-bearing.

• **Load-bearing grills**—The DMJM design offers office space in the tower that is column free, except for the core that rises in the center. The designers achieved this by using the precast, X-shaped grill members in conjunction with precast floorbeams that span from the center core. The grills and the core combine to resist lateral forces in the tower's longitudinal direction.

DMJM made full-size models of the grill elements to solve dimensional and detail problems. The sculptured shapes of the huge X's were difficult to describe effectively in two-dimensional drawings. The models were later used to make the plastic forms needed to cast the grill elements. This procedure eliminated inconsistencies in shape or detail between the drawings and the finished elements. Savings in time and accuracy more than justified the cost of the models. Malcom Leland, sculptural consultant, designed the grill models.

• **Construction operations**—Peter Kiewit Sons' Co. used techniques not often applied to multistory buildings in construction of the tower from the fifth floor up. The contractor built the central core separately by slip-form methods within four weeks. The speed of this operation permitted early installation of elevators.

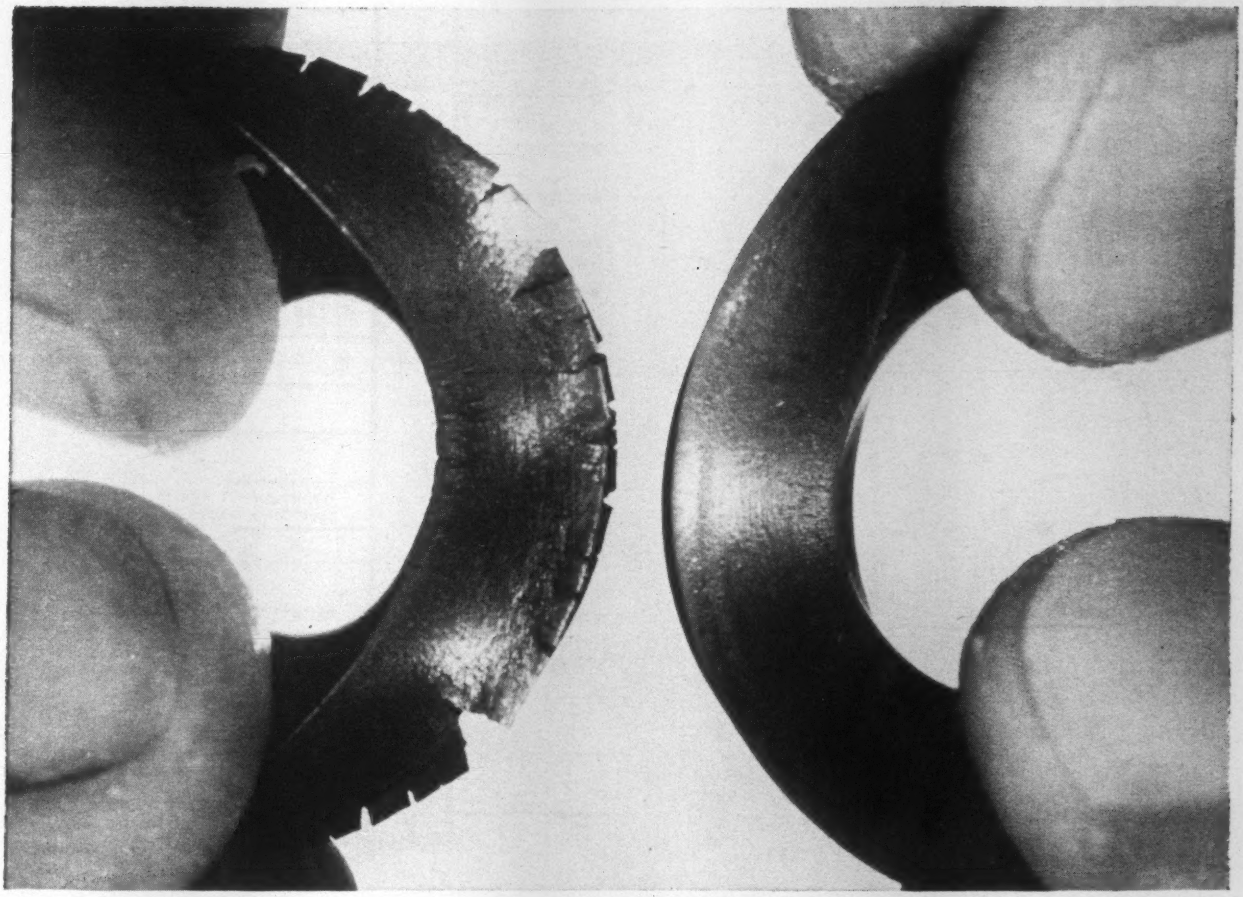
Four weeks was short for this slip-form job, because the existence of apartment buildings in the neighborhood permitted only daytime work. The complex block outs and reinforcing of the central core added to the difficulty. Conventional cast-in-place methods for the tower core would have taken much more time to complete.

The contractor installed the precast grill members and the precast floorbeams story-by-story and tied all the elements together with cast-in-place floor slabs.

Floorbeams are 33 ft long and weigh 5,000 lb each. They are supported at one end in openings formed by block-outs in the central core wall and at the other end by the precast grill.

Some consideration was given to use of prestressed members for the floorbeams. This was ruled out by delays that would have resulted from the necessary tests to establish fire resistance of these members for building-permit purposes.

A rail-mounted tower crane played an important part in the construction. This unit, one of the largest available, was 158 ft high to the jib pivot point.



Two torque converter seals, subjected to 300 hours of service at 325° F., show added protection of D-A Torque Fluid. Seal on left, used with ordinary torque fluid, is brittle and cracked, has shrunk excessively. Seal on right, used with D-A Torque Fluid, remains resilient and reveals no cracks or deterioration. It was protected by D-A's *exclusive* preservative.

Prevent seal trouble, increase converter efficiency

with D-A TORQUE FLUID

Better performance, less maintenance and longer equipment life . . . these are among the benefits you get when you specify D-A Torque Fluid for (1) heavy-duty automatic transmissions, (2) hydraulic systems and (3) rotary compressors.

Note these advantages: D-A Torque Fluid possesses superior oxidation stability, provides increased efficiency through carefully controlled viscosities and allows operation in even the coldest weather because of minus 35° F. pour point.

But that isn't all! D-A Torque Fluid is ideal for all types of rotary compressors because special high-temperature oxidation inhibitors prevent formation of sludge and varnish, extend compressor life and permit longer operation periods between lubrication changes.

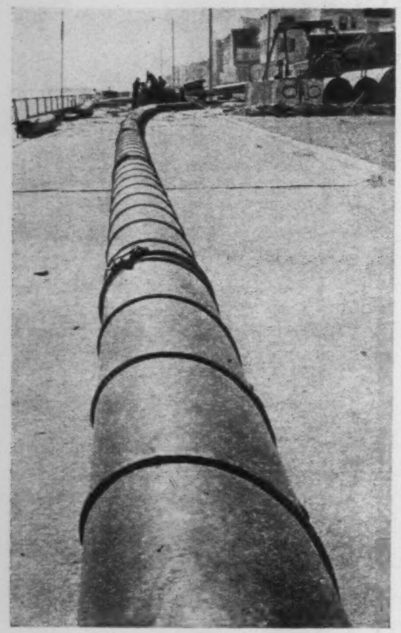
And D-A Torque Fluid gives a big bonus in the protection of rubber seals . . . extends the life of seals, prevents leakage. This added protection is accomplished by a special seal preservative found only in D-A Torque Fluid. Seals last indefinitely . . . shrinkage and cracking are eliminated . . . swelling is controlled to an ideal maximum of 0.2%.

24 HOUR NATIONWIDE SERVICE
D·A
D·A
D·A
D·A
D·A®

Lubricating heavy-duty equipment across the nation since 1919.

D-A LUBRICANT COMPANY, INC. • INDIANAPOLIS 23, IND.

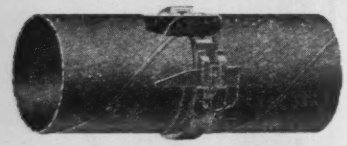
SHORT CUT
TO LONG LINES



Save Work and
Speed the Job with
NAYLOR Pipe and
Wedgelock Couplings

For air, water and ventilating lines, you'll save time and money with this NAYLOR combination.

NAYLOR pipe is light in weight, easy to handle and install. Its lock-seamed, spiralwelded structure assures extra strength and safety.

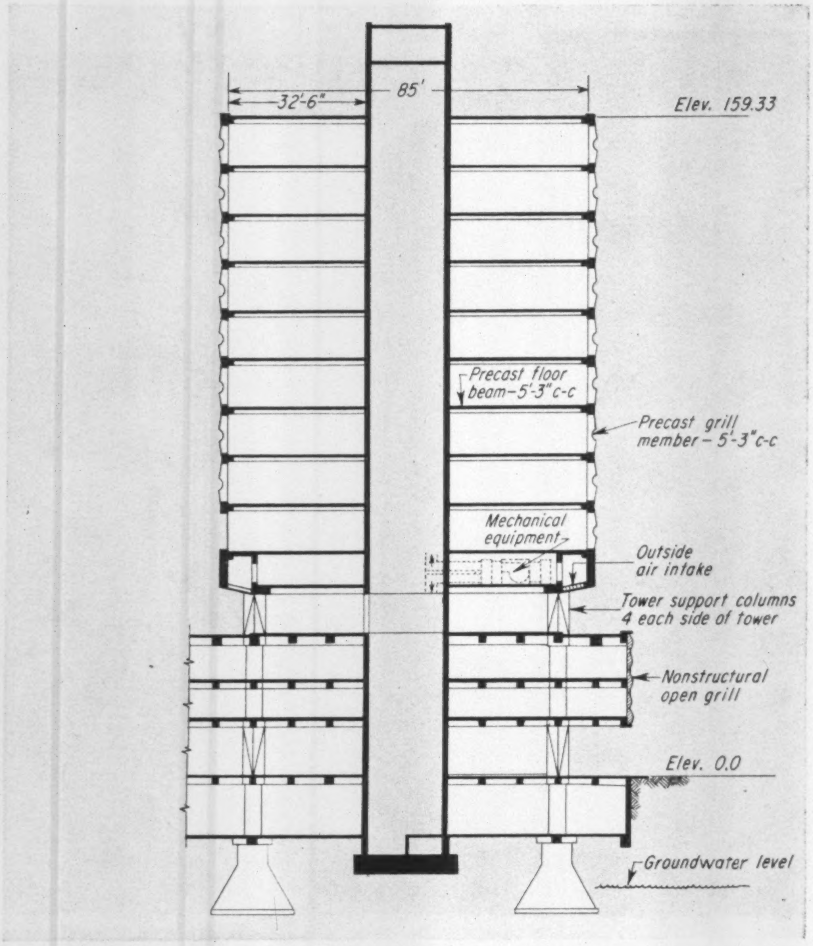


WEDGELOCK couplings provide a positive connection securely anchored in standard weight grooved ends. Speed the job. A hammer is the only tool required to connect or disconnect them. Available in low-pressure and heavy-duty types.

Write for Bulletin No. 59 on pipe, fittings and couplings.

NAYLOR
PIPE Company

General Offices and Plant
1261 East 92nd Street, Chicago 19, Illinois
Eastern U. S. and Foreign Sales Office
60 East 42nd Street, New York 17, N. Y.



CONCRETE FRAME is partitioned by a transition floor housing the building's heating and air-conditioning equipment.

Equipped with a 125-ft jib, it could handle a 5,000-lb load with the jib at a 15-deg angle.

For the tower construction, the crane operated on the basement slab between the tower and the annex structure. This operation required special shoring for the slab. And a section of the annex for a width of some 20 ft along the tower crane tracks had to be left incomplete as long as the crane was in place. But this scheme permitted the crane to handle construction of the tower and most of the annex structure as well.

DMJM expected to devote considerable design time to adapting various concrete mixes to this complex structure. But only two basic strengths, 3,750 psi and 5,000 psi, went into the entire superstructure. The builder used 3,750-psi lightweight concrete for all slabs and beams above the fifth floor and 5,000-psi lightweight concrete for the tower grill.

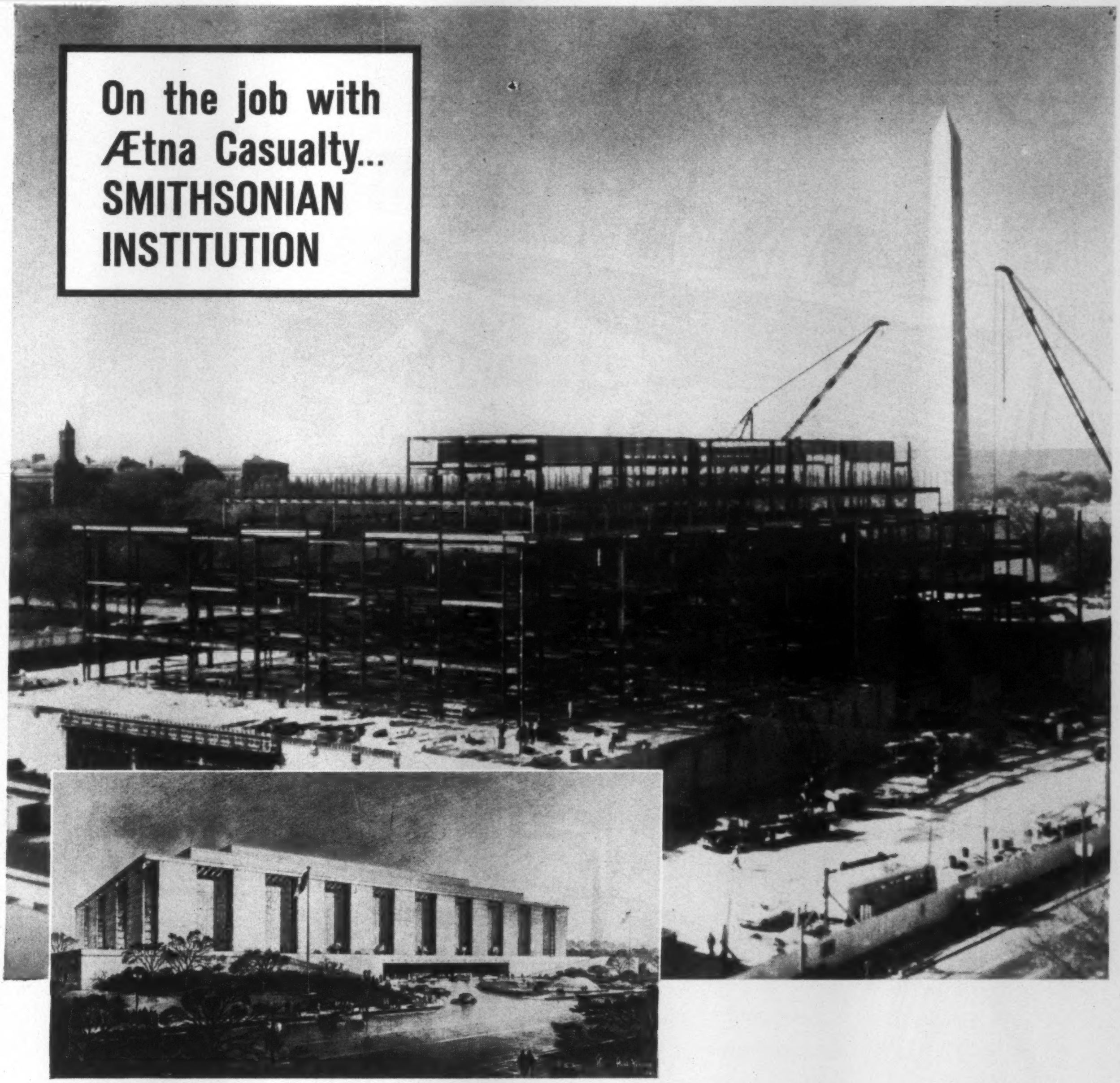
Below the fifth floor where weight saving for seismic design is not so important, conventional-weight concrete was used. Main columns are of 5,000-psi concrete and horizontal framing of 3,750-psi.

• **Folded-plate roof**—As a further demonstration of the versatility of concrete, the designers topped the executive offices on the top floor of the annex structure with a folded-plate roof. This covers some 8,750 sq ft, leaving a 25-ft-square opening at the center for a patio.

The roof is a 5-in.-thick folded slab supported at the corners by four thrust blocks designed to take the total lateral earthquake load and the corresponding axial dead and live loads. It rises from the four thrust blocks to cross a wide span without beams. The structure also has columns around its outside and inside perimeters to take axial load only.

The building's cost, $3.25 million for a total gross area of 250,000 sq ft, is about $13 per sq ft, low for a first-class multistory building.

Arthur Gilbert and Edward Rothschild of Los Angeles, are the owners-developers of the American Cement Building. Riverside Cement Co., a division of the American Cement Corp., is the principal tenant.



On the job with Ætna Casualty... SMITHSONIAN INSTITUTION

The $24,000,000 Smithsonian Institution in Washington, D.C., was a big job . . . but not too large for Ætna Casualty to accommodate the bonding needs of the contractor.

When you choose a bonding company, make your choice on these qualities:

SERVICE: Ætna Casualty's offices in more than 70 principal cities coast-to-coast—plus thousands of experienced agents—assure you of quick and efficient service.

EXPERIENCE: Ætna Casualty's experts are carefully trained and thoroughly skilled. Their participation in many types of jobs gives them the knowledge to handle your bonding needs for every kind or size of operation.

CAPACITY: Ætna Casualty is able to handle the largest projects. Its qualifying limit as set by the Federal Government is in the highest group.

Choose your bonding company on these qualities and you'll choose

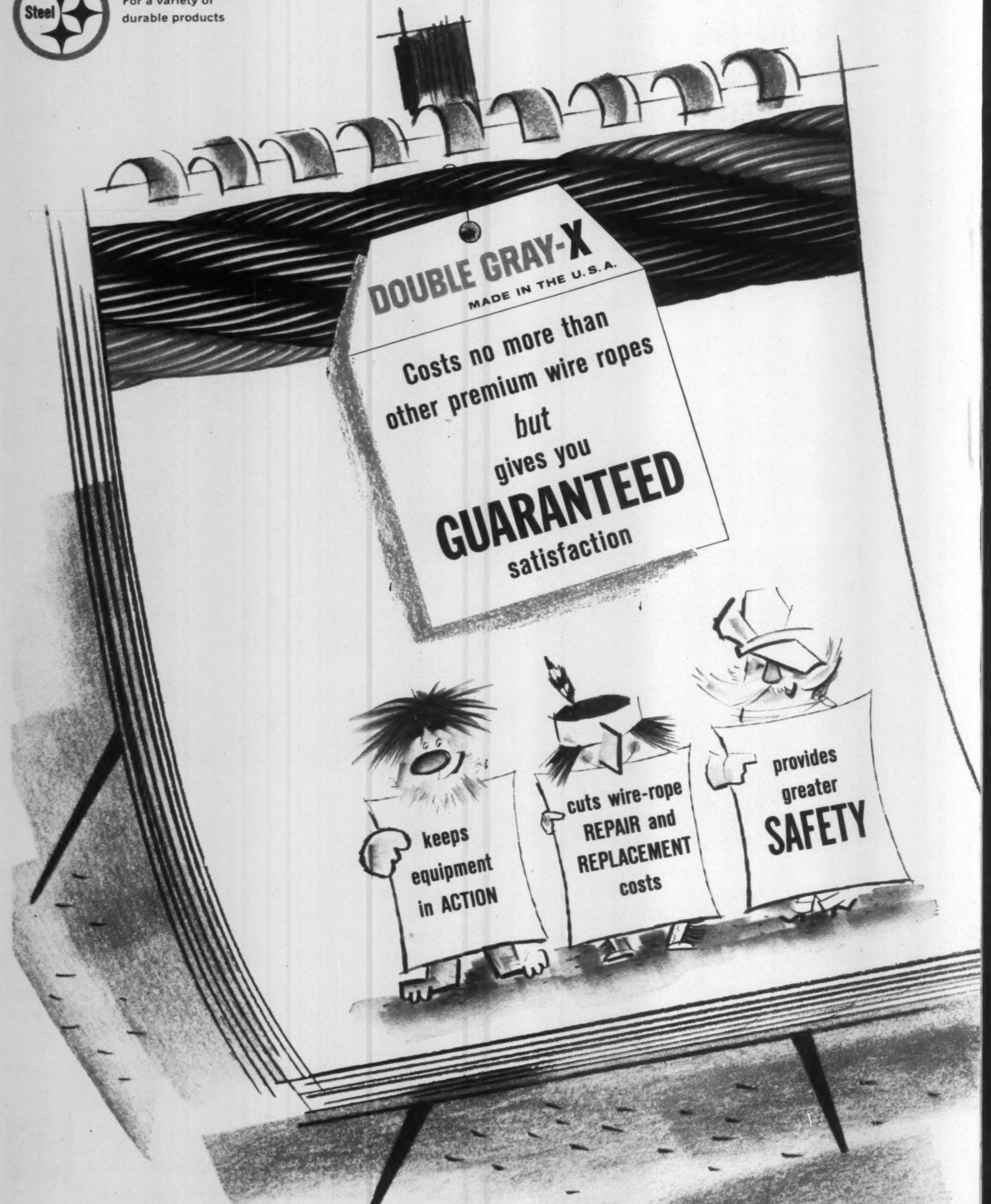
ÆTNA CASUALTY

Quality BONDING Service for contractors in every field.

Ætna Casualty and Surety Company, Hartford 15, Conn. • *Affiliated with* Ætna Life Insurance Company • Standard Fire Insurance Company • The Excelsior Life, Canada

Steel

For a variety of
durable products


DOUBLE GRAY-X
MADE IN THE U.S.A.
Costs no more than
other premium wire ropes
but
gives you
GUARANTEED
satisfaction
keeps
equipment
in ACTION
cuts wire-rope
REPAIR and
REPLACEMENT
costs
provides
greater
SAFETY

DOUBLE GRAY®-X...

the rope that's guaranteed to last longer

CF&I-Wickwire salesmen are visiting wire rope users from coast-to-coast, presenting the facts on Double Gray-X, the wire rope that's *guaranteed* to last longer. When he calls he will tell you about:

- **Why Double Gray-X lasts longer**
- **Complete laboratory proof**
- **Conclusive field performance proof**

CF&I-Wickwire's exclusive *guarantee* makes it possible for you to test our claims about the long life of Double Gray-X without risk. So *if you're interested in lower rope costs ... if you're looking for ways to lower your costly equipment downtime*...get the documented facts on Double Gray-X by sending in this coupon.

The Colorado Fuel and Iron Corporation
Wickwire Spencer Steel Division
Wire Rope General Sales Department
P. O. Box 232, Palmer, Mass.

☐ I'd like facts on CF&I-Wickwire's **guaranteed** wire rope . . . Double Gray-X

NAME ________________ TITLE ________________

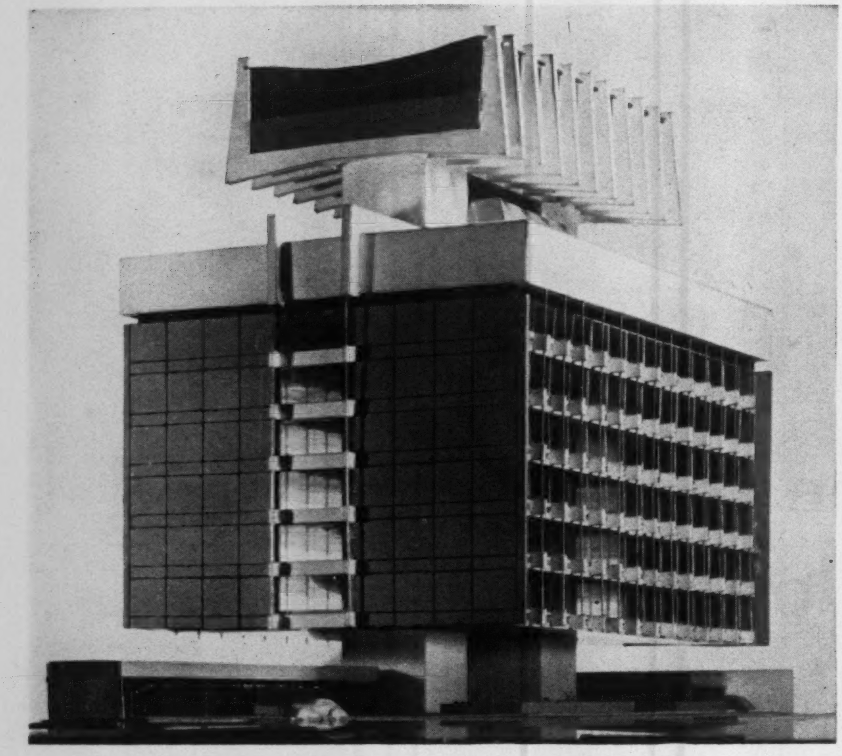
COMPANY ________________ ADDRESS ________________

CITY ________________ STATE ________________

The Colorado Fuel and Iron Corporation
Denver • Oakland • New York
Sales Offices in Key Cities

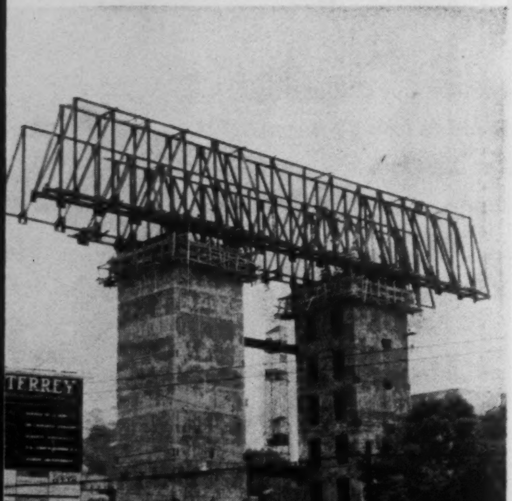
CF&I STEEL MADE IN U.S.A.

8393



Six-story Mexico City office building has . . .

Floors Hung From Roof Trusses



TRUSSES support forms for main beams.

A six-story office building under construction in Mexico City is 92 x 131 ft in plain, but the only columns in the structure are two reinforced concrete towers.

The towers, which house elevators, stairways and service facilities, carry concrete beams and steel trusses from which the building's floors will hang. This design makes possible floors unobstructed by interior columns.

Efficient use of materials (concrete in compression, steel in tension) keep framing costs down. Also, under Mexico City soil conditions, concentration of loads in a central area helps keep foundation costs down.

The towers sit on a floating foundation consisting of a grid of concrete cells—an inverted beam and girder floor. With interior columns, the foundation would have been much larger, at least the same size as the floors.

• **Suspension system**—The towers, 56 ft c-c, are about 19 ft square and 130 ft high. Their walls are nearly 14 in. thick. They support the inner part of the floors, while the outer edges of the floors are supported by hangers. At a height of 98 ft, the level of the main roof, two parallel concrete beams, 20 ft apart, project 28 ft out from the towers to carry part of the suspension system. These beams are 24 in. wide and 19 ft deep. Space between the beams will be used for archives, telephone switchboard and other services.

Fourteen 92-ft-long steel trusses span the beams and cantilever 36 ft beyond to carry the rest of the suspension system. The trusses are 10½ ft deep.

The hangers are rectangular tubular sections, 3½ x 7 in. that are welded to and support 28-in.-deep open-web steel joists at each floor. The inner ends of the joists are welded to steel inserts.

At the top of the towers, above the main roof, is a restaurant. It nestler inside eleven concrete frames that project from the towers. And it will be roofed by a concrete catenary.

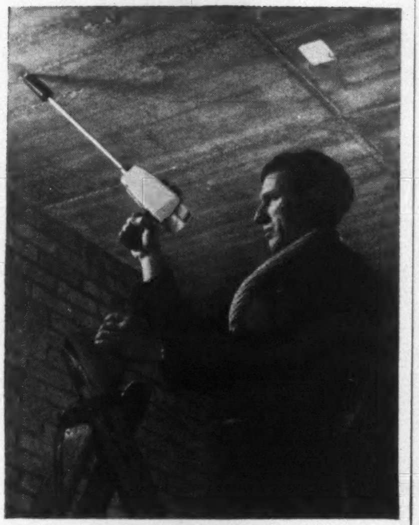
Glass spandrels and windows in anodized aluminum frames make up the building's facade. All the steel hangers and the ends of the 19-ft-deep concrete beams will be left exposed.

• **Construction status**—The foundations are complete. During construction, the cells were filled with water to counter the uplift from groundwater. Later, they will be used as sumps for waste water and groundwater and as cisterns for hydopneumatic equipment.

The towers are also complete. They were cast in 11½-ft lifts in wood forms, which were bolted to concrete previously cast. After the forms were stripped, short lengths of steel beam were welded to steel inserts in the tower walls of such floor level. Later, the floor joists were welded to these stubs.

When the towers reached main-roof level, the contractor set two pairs of steel trusses on top to serve as falsework. Each part supported the forms for one of the 19-ft-deep concrete beams, which was cast in eight stages. Since the steel trusses that carry the suspension system pass through these beams, they had to be inserted in the forms before concrete was placed. The section of each truss that spans the beams was set in the forms, and the rest of the truss was welded to it after the concrete beams had attained full strength. Later, the hangers will be attached to the trusses and beams and the floor beams erected.

Architect Enrique de la Mora y Palomar with Alberto Gonzalez Pozo as collaborating architect designed the building for Compania de Seguros Monterrey, a life insurance firm. Leonardo Zeevaert was the structural engineer. S. G. Construcciones, S. A., is the general contractor.



Housing and Supermarkets Planned for South America

The International Basic Economy Corp. of New York City (IBEC) plans to build 800 low-cost houses in the suburbs of Lima, Peru, and five supermarkets in Buenos Aires, Argentina, as part of its program for raising living standards in the poorer nations.

Construction costs will total about $740,000 for the first 220 houses scheduled to be built within the next six months. They will sell within a price range of $3,000 to $5,000.

IBEC's investment in the Buenos Aires supermarkets will total about $1.5 million. American-style supermarkets were proposed by the Argentine Economics Minister as an antidote to unfair profiteering by local food stores.

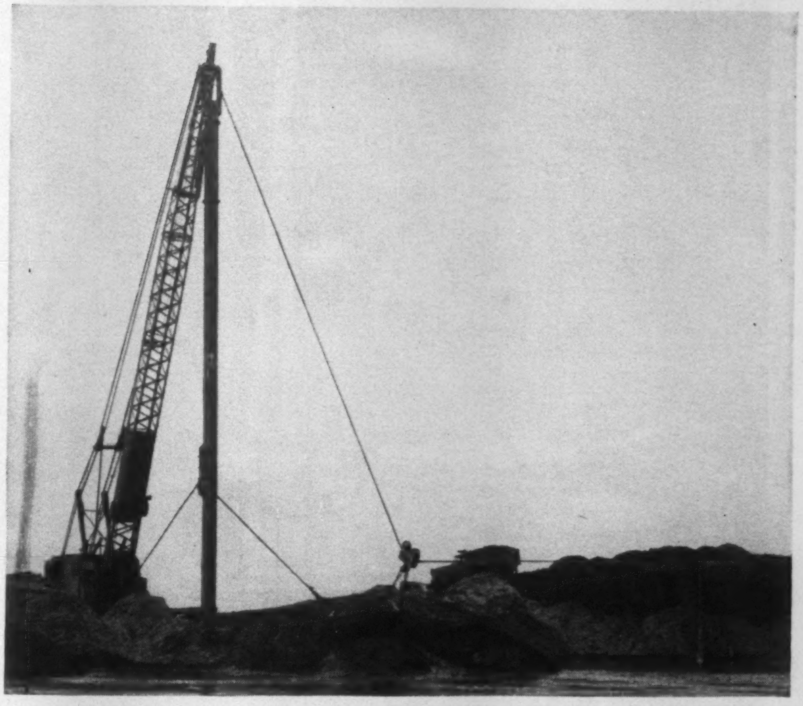
Through subsidiary companies IBEC operates in Europe as well as in North and South America. The IBEC Housing Division built 6,000 houses in Puerto Rico similar to those scheduled for construction in Peru.

$80-Million Rail Program Planned in Yugoslavia

Yugoslavia's Macedonian Republic will spend $80 million over the next five years to modernize its existing rail transportation system and to build a new line between Gostivar and Ohrid.

The program includes construction of a freight station at Skopje and installation of automatic signals and telecommunications all along the main lines.

Yugoslavian companies will produce much of the equipment, but the plan calls for purchase abroad of eight completely motorized trains, 37 diesel engines and more than 1,000 passenger and freight cars.



Shoreline Reclamation by Crescent Scraper

Several million yards of sand and gravel are being used to extend the plant area of a Canadian steel company. Bottom-dump barges are used for the initial 20 ft. of fill. The additional 10 ft. below water and up to 15 ft. above lake level is built by redistributing the barge piles along the existing shore line.

The material is redistributed by a crane using a 5-yd. Crescent Scraper Bucket and carrier. On operating spans of up to 350 ft., the crane's hoisting line is used as a track cable. It is reeved through a block at the boom tip to a tail barge anchored offshore.

The barge swings on 200 ft. of anchor cable which permits a long period of crane operation before the anchor is shifted to a new location. The crane travels along the shore reclaiming material from a pie-shaped segment with the tail barge anchor as the vertex of the angle. The Crescent Bucket returns by gravity the full 350-ft. span. At average haul distances, it delivers 200 yd. per hr.

A Sauerman Crescent Scraper and carrier with a dragline crane is often the most economical solution to difficult excavating jobs. The normal reach of the dragline is greatly extended by using a track cable with a Crescent and carrier assembly. So equipped, its range is limited only by the spooling capacity of the drums.

Tubular mast supports 80 ft. boom on track cable setup. Tail barge in background. Load line is reeved through a Sauerman Fairlead on mast.

This arrangement has been used quite successfully for contract excavating jobs involving relatively small quantities of material. In many cases where unstable ground is encountered, the crane unit may be located on firm ground and the use of mats eliminated.

Find out how much you can extend the reach of your crane and increase its capacity. Write or call giving the make, model number and boom length of your machine. Field Report 231 and Catalog J. gives more information on Scraper operations with cranes.

SAUERMAN BROS., INC. 632 SO. 28th AVE. BELLWOOD, ILL.
LInden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

POWER...that's ready when you are

With Homelite Carryable Generators on the job, you'll always have a dependable source of power . . . that's ready when you are . . . to operate labor-saving tools, brilliant floodlights and other electrical equipment. You can choose from Homelite's famous-for-quality 2-cycle engine driven models. Or pick from Homelite's new line of economy-priced 4-cycle engine-driven generators (available for operation on gasoline or LP gas). There are 115 volt, 115/230 volt and high-cycle units. Sizes from 1500 watts to 5000 watts. Every one constructed for heavy-duty operation, light weight for easy carrying and featuring Homelite's exclusive TOOL-SAVER voltage control.

Write for details today. We're ready when you are to demonstrate any model Homelite generator on your job.

Illustration shows Homelite Model 42A115/230 generator. Capacity: Up to 5000 watts of 115 and 230 volt, 60 cycle AC power. Engine: 4-cycle Wisconsin

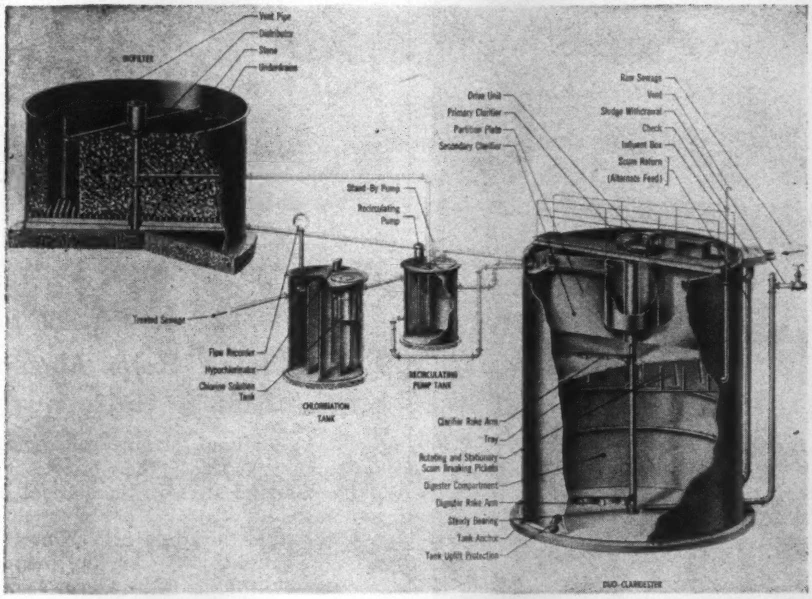
Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

HOMELITE

CARRYABLE
CONCRETE VIBRATORS
PUMPS • **GENERATORS** • BLOWERS

HOMELITE: A DIVISION OF TEXTRON INC.-1108 RIVERDALE AVE., PORT CHESTER, NEW YORK • IN CANADA • TERRY MACHINERY CO., LTD.

New Products


BIOFILTER
Vent Pipe
Distributor
Stone
Underdrain
Drive Unit
Primary Clarifier
Partition Plate
Secondary Clarifier
Raw Sewage
Vent
Sludge Withdrawal
Check
Influent Box
Scum Return
(Alternate Feed)
Stand-By Pump
Recirculating Pump
Treated Sewage
Flow Recorder
Hypochlorinator
Chlorine Solution Tank
CHLORINATION TANK
RECIRCULATING PUMP TANK
Clarifier Rake Arm
Tray
Rotating and Stationary Scum Breaking Pickets
Digester Compartment
Digester Rake Arm
Steady Bearing
Tank Anchor
Tank Uplift Protection
DUO-CLARIDIGESTER

Compact Plants to Treat Sewage

Dorr-Oliver has developed a series of compact sewage-treatment plants in a wide range of sizes. The units handle from 10,000 to 180,000 gallons a day based on a 24-hour run off.

They are intended for use in housing developments, shopping centers and recreational facilities.

The treatment plants use the company's version of the trickling filter process—Biofiltration. Their process includes chlorination and permits safe disposal of the effluent in nearby water courses. The units were designed specifically to meet all requirements of local, state and national regulatory agencies.

The maker says that a high recirculation rate and separate sludge digestion and storage permit the plants to handle varying flows and strengths of sewage automatically.

Power requirements for a 60,000 gallon per day unit (serves 600 persons) are about 1.75 kw. Local Dorr-Oliver representatives will arrange routine servicing.

Smaller units are shipped already assembled; company crews will assemble larger sizes at the site. DORR-OLIVER INC., STAMFORD, CONN.

Machine Makes Friction Weld

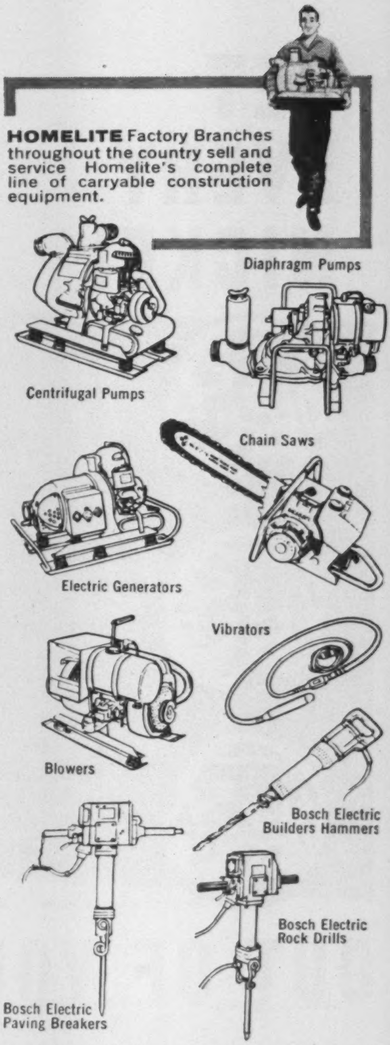
American Machine and Foundry Co. has a prototype machine that makes what is called a friction weld. Friction welding is not a new technique, but has been refined and developed by AMF.

It consists of holding one object still while the other is rotated at high speeds and pressed against the first. After a specified period of time, the machine abruptly stops rotating, pressure is increased, and the objects held still for a specified period.

To weld high-alloy to low-carbon steel, for example, the rotating element spins at about 12,000 rpm. The rotating section contacts the static section and pressure is gradually built up. The rotating action increases the temperature, and metal at the point of contact becomes molten. Rotation is stopped as rapidly as possible and pressure is applied and held to complete the weld.

AMF claims that the new method can weld a wide range of different materials: copper to brass, brass to aluminum, and aluminum to steel.

Recently, the company used friction welding to fill an industrial order. Some 1,000 welds were made on the prototype machine in welding male and female tool joints (1.750 in. in dia). Cost data carefully compiled during the production run indicate that the new friction welded joint is competitive with threaded and coupled joints and with pressure welded joints. About 20 welds per hour were made. AMERICAN MACHINE AND FOUNDRY CO., 261 MADISON AVENUE, NEW YORK 16, N. Y.


Diaphragm Pumps
Centrifugal Pumps
Chain Saws
Electric Generators
Vibrators
Blowers
Bosch Electric Builders Hammers
Bosch Electric Rock Drills
Bosch Electric Paving Breakers

HOMELITE Factory Branches throughout the country sell and service Homelite's complete line of carryable construction equipment.

HOMELITE FACTORY BRANCHES

EAST: CONNECTICUT: Greenwich, Hartford • NEW JERSEY: North Arlington, Woodbridge • NEW YORK: Albany (Latham), Buffalo, New York (North Arlington, N. J.), Rochester, Syracuse • MAINE: Orono • MARYLAND: Baltimore • MASSACHUSETTS: Boston (Allston) • PENNSYLVANIA: Altoona, Erie, Harrisburg, Hazleton, Philadelphia, Pittsburgh, Malvern • VIRGINIA: Arlington • WEST VIRGINIA: Charleston, Clarksburg

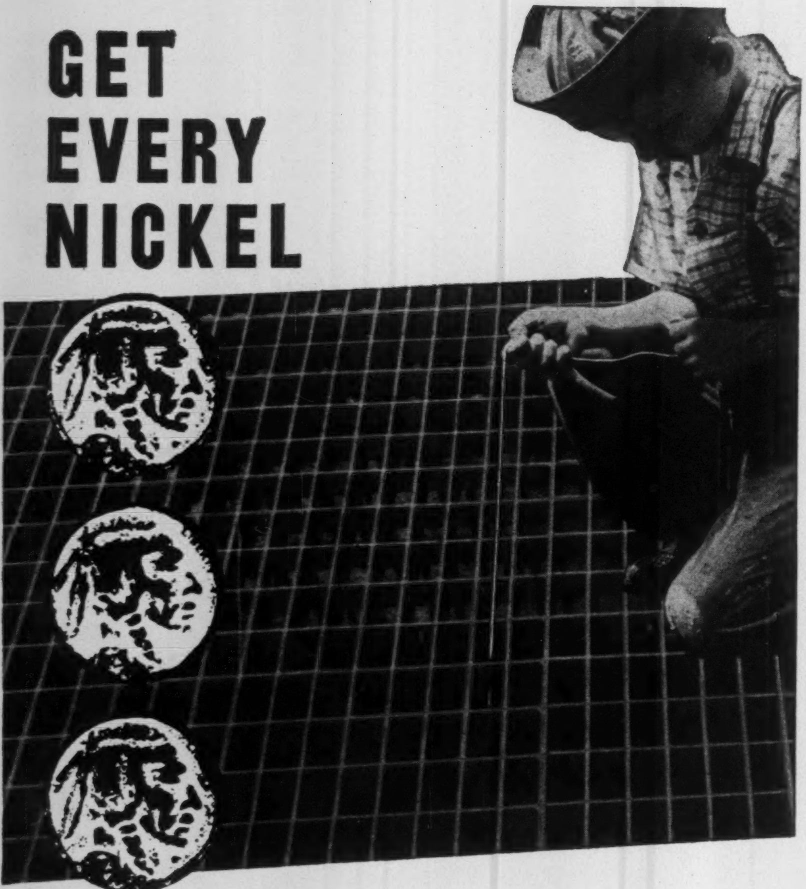
SOUTH: GEORGIA: Atlanta • FLORIDA: Jacksonville, Miami • LOUISIANA: New Orleans (Metairie), Shreveport (Bossier City) • NORTH CAROLINA: Charlotte, Raleigh • OKLAHOMA: Oklahoma City • TENNESSEE: Knoxville, Memphis • TEXAS: Dallas

MID-WEST: ILLINOIS: Chicago (Stone Park) • INDIANA: Indianapolis • MICHIGAN: Detroit, Grand Rapids • MINNESOTA: St. Paul • MISSOURI: Kansas City, St. Louis • NEBRASKA: Omaha • OHIO: Cincinnati, Cleveland, Toledo • WISCONSIN: Milwaukee

WEST: CALIFORNIA: Fresno, Los Angeles (Alhambra), Sacramento, San Francisco • COLORADO: Denver • OREGON: Portland • UTAH: Salt Lake City • WASHINGTON: Seattle, Spokane

HOMELITE
A DIVISION OF TEXTRON INC.
1108 Riverdale Ave., Port Chester, New York
In Canada:
TERRY MACHINERY CO. LTD.

GET
EVERY
NICKEL



OUT OF YOUR GRATING

When you select a grating there's one way to be sure you are getting every nickel's worth of value out of it. Specify IRVICO. You pay only the fair, competitive price. You get superior workmanship, perfect fit, and dependable service. Those are the things which make every nickel really count; that save you dollars in the long run.

IRVICO gratings are available in every type: riveted, welded, pressure-locked; custom fabricated and engineered to meet your exact job requirements.

Catalog on request

IRVICO®

IRVING SUBWAY
GRATING CO., Inc.

ORIGINATORS OF THE GRATING INDUSTRY
EST. 1902

Offices and Plants at:
5063 27th St., LONG ISLAND CITY 1, N. Y
1863 10th St., OAKLAND 20, CALIFORNIA

Brick Clamp Helps Mason Spread Mortar Uniformly

This aluminum clamp, called the Automason, speeds the bricklayer's production and saves on the amount of mortar used.

Using the thickness of the Automason's clamping jaw as a guide, masons can speedily apply just the proper thickness of mortar mix to each brick. Because level mortar helps square up bricks faster than an irregular layer, time savings can also be realized as the mason lays each brick, says the manufacturer.

The Automason device comes in two sizes, for Regular and Roman size bricks. AUTOMASON, Box 156, EAU CLAIRE, WIS.

Instrument Firm Offers Two Soil Testing Devices

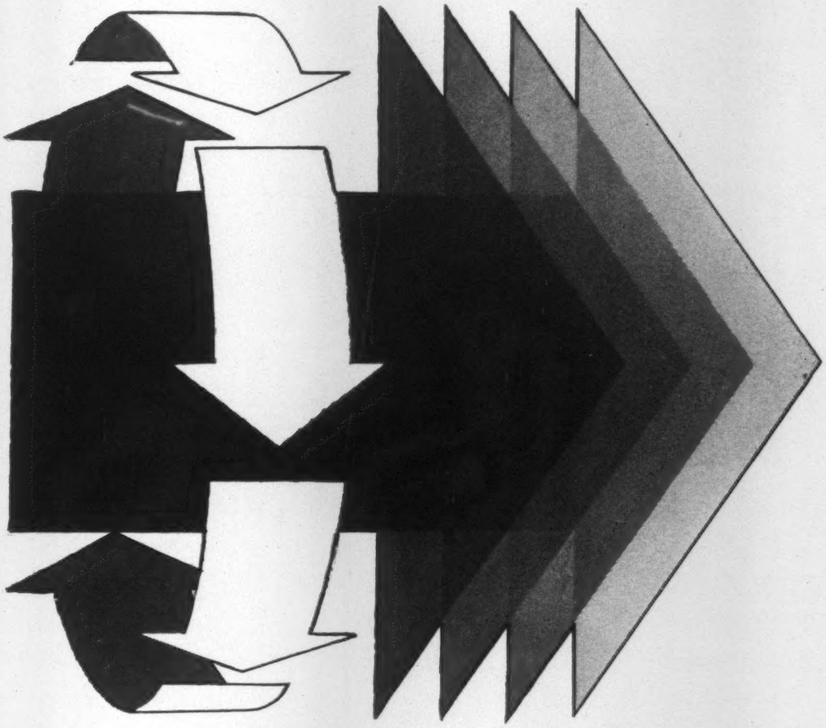
The Testlab Corp., maker of equipment for testing soils, has two new instruments available.

One device measures soil density and the other is for use in conjunction with the firm's nuclear moisture/density gage.

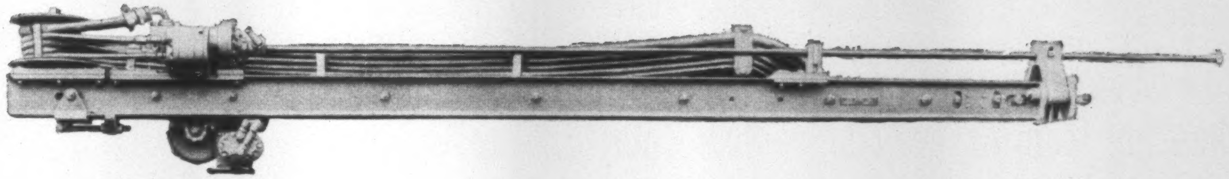
The first of these, called the Volutester, measures the density of soil in the field using the balloon-density method.

Two models are available. One version is rigged so that an operator can kneel to hold the unit down while testing. It is equipped with a plastic graduated cylinder, a hand pump and a pressure equalizing relief valve. The other version, without these features, is lower priced.

The other instrument is a portable electronic scaler for detecting radioactive isotopes. This unit weighs 15 lb and is battery operated. The scaler is the basic instrument used in recording the neutron and gamma ray count detected with the firm's nuclear moisture and density meter system. TESTLAB CORP., 3398 N. MILWAUKEE AVE., CHICAGO 41, ILL.



NEW KIND OF ROCK DRILL



JOY RPD **combines rotary and percussion drilling for fastest penetration** The new Joy Rotary Percussion Drill has turned in footage reports that are three times as fast as conventional percussion drills in most formations. Rotation on the RPD is supplied by a hydraulic motor; percussion is supplied by a high-speed free-piston hammer unit. These elements combine the best features of high speed rotary and percussion drilling to give the fastest penetration possible. Torque and feed pressure can be varied to meet the drilling conditions encountered in mixed formations.

The RPD is best suited for 1¼″ to 1¾″ holes up to 16 feet deep, using specially designed Joy tungsten carbide bits. Mounted on Joy Hydro Drill Jibs the drill is particularly suited to tunneling and mining operations. Get complete information on this new kind of drill. Write for Bulletin 3529-24.

JOY CONSTRUCTION EQUIPMENT IS SOLD AND SERVICED BY THE JOY DISTRIBUTOR IN YOUR AREA

Portable Compressors

Trac Drills

Tungsten Carbide Rock Bits

Hand-Held Rock Drills

JOY

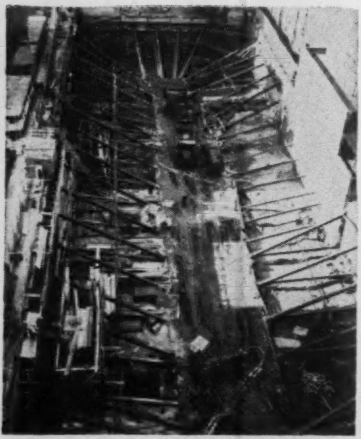
Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company
(Canada) Limited, Galt, Ontario

THIS?

OR

THIS?



Conventional method. Excavation and formwork are encumbered by the raker braces required to support the system of horizontal wood sheeting and soldier beams.

In new method developed by Spencer, White & Prentis, sheeting is supported from the **exterior** side. Cables are first grouted into sockets in bedrock. These cables are then prestressed by a jacking system and attached to the wales. The tie-back method is thus "pretested" for strength and safety.

Now, Pretest cable tie-backs support wood sheeting from exterior side. New "clutter-free" method proves successful wherever used.

Pat. App. for

As one installation follows another—with "A-OK" results each time—the Pretest tie-back method gains increasing numbers of friends among construction men everywhere.

This broadening acceptance reflects many factors: the dependable results, the greater safety of the method and the valuable advantages it offers. You have no encumbering braces to contend with. Your free-and-clear work area permits speed and ease of operation not possible before.

Send for job studies which explain the tie-back principle—developed by foundation specialists with over 40 years experience—described by one of the leading construction editors as a "technological breakthrough."

Spencer, White & Prentis INC.

10 E. 40th St., New York 16, N. Y.

Detroit: 2033 Park Ave. • Chicago: 221 North LaSalle St. • Washington, D. C.: Tower Bldg.

Foundations Piling Underpinning Shoring Cofferdams Special Services

New Product Briefs

Masonry Bits

Necor bits, ½ to 1¼ in. For drilling concrete, tile, terrazzo, marble, brick and porcelain. Carbide cutting edge. Can be used with any electric rotary hand drill or drilling machine. New England Carbide Tool Co., Medford, Mass.

Aluminum Jacket for Pipe Ells

Aluminum jacket called a "Humped Elbow" protects insulation at pipe ells. Humped feature permits 13 different size jackets to cover 109 combinations of pipe sizes and insulation thicknesses. General Aluminum Supply Co., 1515 Eastern Avenue, Kansas City 26, Mo.

Low-Flow Valves

Line of valves includes five models for use in regulating flow of small streams of air, water, steam or chemical solutions. Three body sizes in 1400 series—½, ¾ and 1 in.—in full range of materials and body ratings. Valve Div., Minneapolis-Honeywell Regulator Co., Fort Washington, Pa.

Centrifugal Pumps

Line of centrifugal pumps, hermetically sealed, for use with toxic and volatile liquids. Has self-adjusting bearing. Discharges range from 1 in. to 5 in. Designed for 120 psig at temperatures from 40F to 250F. Buffalo Pumps Div., Buffalo Forge Co., Buffalo 5, N. Y.

Materials Testing Machine

Universal testing machine for construction materials. Tests reinforcing bars No. 2 through No. 11 in tension and 6x12-in. concrete cylinders in compression. Capacity Model LT-800, 250,000 lb; Model LT-900, 400,000 lb. Accessories for testing blocks in compression, bricks in compression and modulus of rupture, beams in transverse loading and weldments in bending and tension. Forney's, Inc., Tester Division, New Castle, Pa.

Powered Stud Driver

Control-A-Stud transmits energy from an explosive charge directly to a plunger, indirectly to the stud, lessening chance of ricochet. For driving into hard steel, hard and soft concrete. Gas chamber controls depth, permits second shot on same stud, and eliminates powder burns on wall, the manufacturer says. Silefs, Inc., 1501 N. Davidson St. P. P. Box 3721, Charlotte 3, N. C.

Pipe Wrench

Lightweight, high-strength Gripso-Matic pipe wrench snaps open and locks to position with spring-loaded ratchet. Adjustable jaw calibrated for fast setting. Sizes: 6, 8, 10 and 14 in. Standard Fittings Co., 82 Herbert St., Framingham, Mass.

CATERPILLAR REPORTS

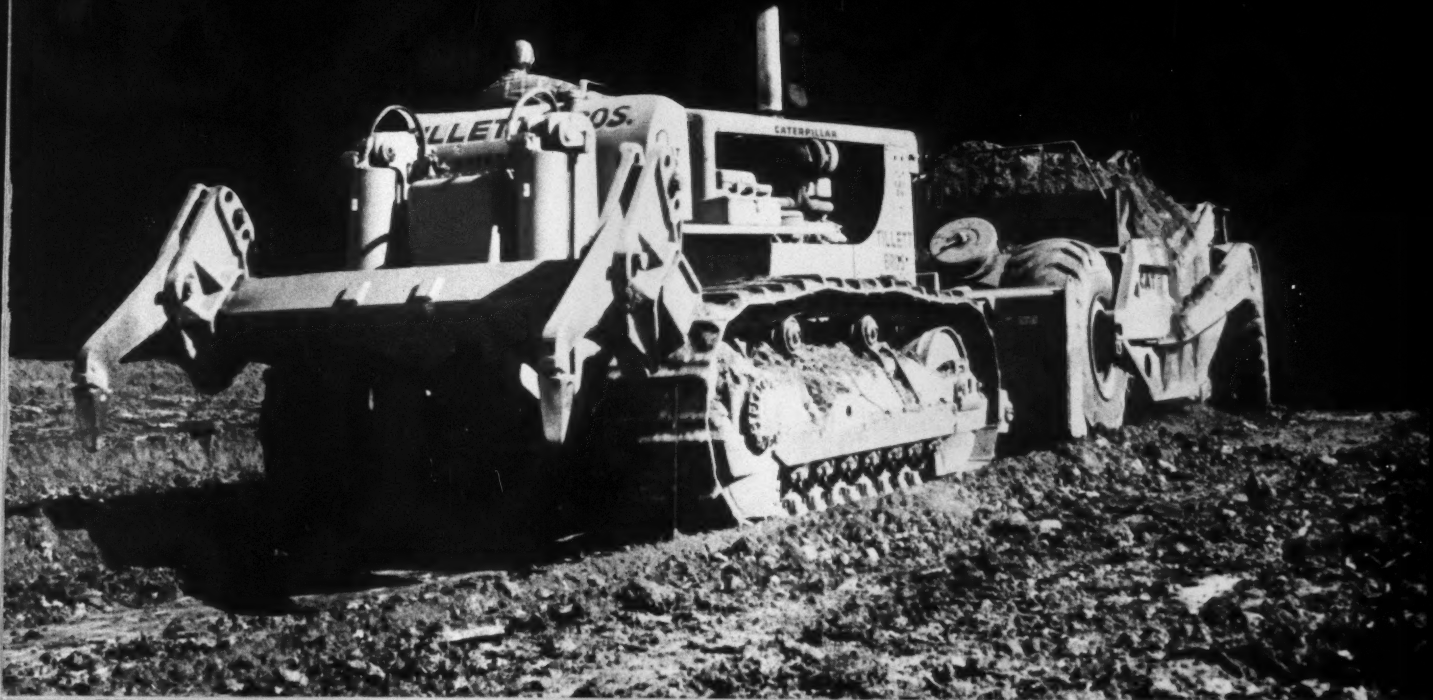
On the following pages:

The right machine for the right job

How to move 1,300,000 yards of dirt—with a Motor Grader!

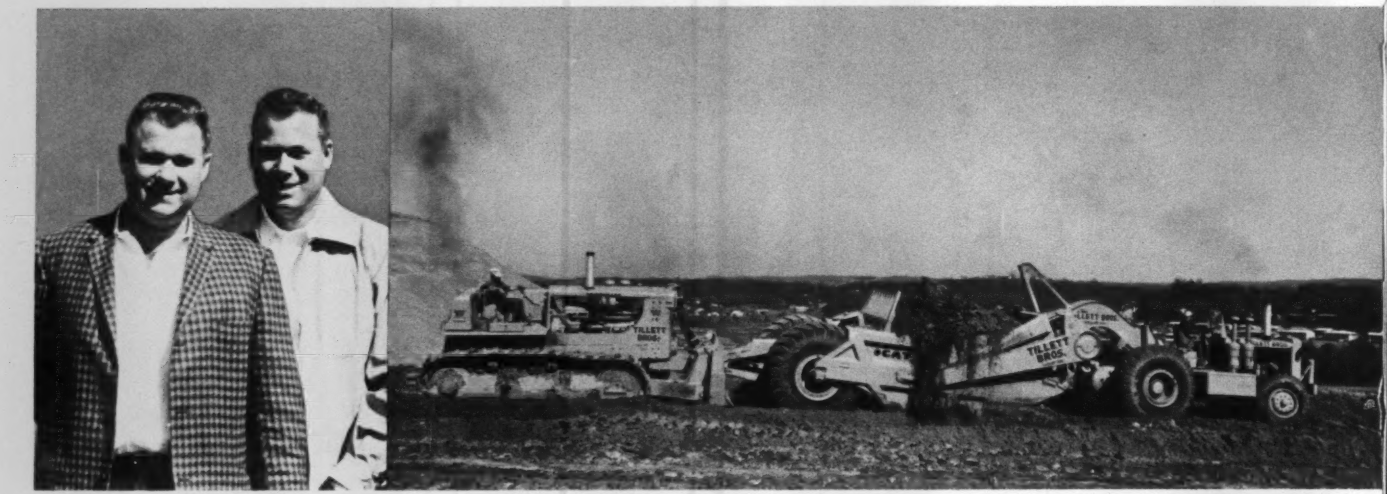
Can you do a shovel's work cheaper with a Cat loader?

The inside story on lifetime lubricated rollers


TILLETT BROS.
CATERPILLAR

Many contractors report methods they use (or have developed) that save money. Here's one contractor who isn't satisfied with just a cost saving method – he tries for at least a double savings. It's a philosophy of

The right machine for the right job



1.2 million yards moved in the first 60 days despite miserable weather—that takes some special doing. But it is almost routine for Tillett Bros. Construction Co., Inc. Their methods pay off with lowest cost, highest production. Twelve years ago Joe and Gerald Tillett owned one machine and dug farm ponds. Today they are one of Tennessee's largest contractors with over $4 million of Interstate work. They personally stay on top of every job, flying from job to job or keeping in touch by radio.

THE RIGHT SCRAPER FOR THE RIGHT JOB

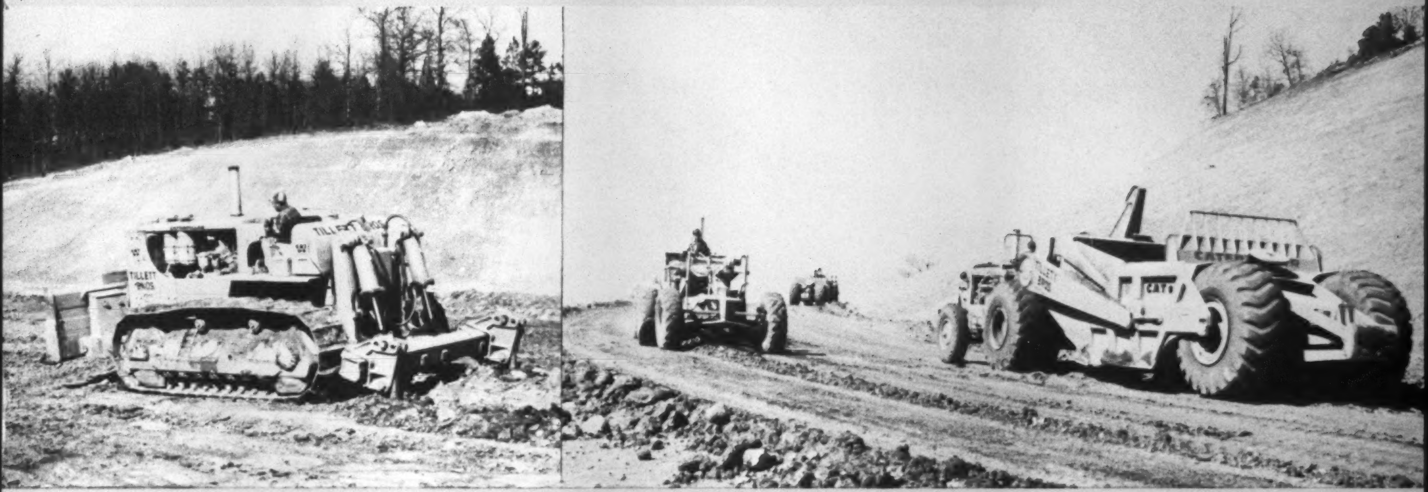
There are obvious advantages in using two-wheel scrapers on some jobs and four-wheel units on others. But the Tilletts get double savings—they use both on the same job. On an Interstate 75 job near Chattanooga, they are moving over 4 million yards of tough chert. Prime movers: three Cat DW20-482s (34 cu. yd. heaped) and eleven DW21-470s (27 cu. yd. heaped). Most contractors avoid mixing their fleet, preferring either two-wheel or four-wheel rigs. The Tilletts find more savings with a mix. On 1500-ft. hauls both units move about the same amount of dirt. But on longer hauls, the faster, bigger DW20-482s turn in more production at lower cost. On shorter hauls, the DW21s have the advantage. Since hauls vary on a single job, the Tilletts take advantage of *both* types.

They have definite ideas about which machines and what methods are best. For example, on another big highway project near Knoxville—where they ran into rock and muck, and hauls were short—they depended primarily on Cat crawler-drawn scrapers. Tillett Bros. use their D8-463s (29 cu. yd. heaped) for the rough and short haul work, their fast-moving wheel units for big production. The crawlers don't have to wait for good conditions; they can move right in through mud and steep grades to build up the haul roads, open cuts and fills. *The right machine at the right time—money saved, time saved.*

SPECIALIZED MACHINES—OR "MULTI-PURPOSE"

Every job has a wide variety of dirt-moving tasks, from opening up and stripping to long hauls. Some contractors have tried "multi-purpose" machines in the attempt to handle all these conditions with one type rig. The Tilletts tested them too.

–right now



But they found the *right* machines will do it better, faster and cheaper—and with lower initial investment. They open up the entire job as quickly as possible, building several haul roads so, in bad weather, they have a choice of work to do. This lets their rubber-tired machines work efficiently regardless of weather. That's how they were able to move 1.2 million yards in the first 60 days on the Chattanooga job, despite miserable winter weather.

Wheel scrapers are supposed to be high-speed haulers—the Tilletts do everything possible to make sure they are. Haul roads are built 50 feet wide for easy passing at high speed. High speed isn't enough; they want *highest* speed from each unit. Most contractors know haul roads should be kept smooth and hard. The Tilletts make sure their roads are the best. Four Cat Motor Graders work constantly on their roads. Double savings? Yes! Their haul units barrel from cut to fill almost all the way at top speed, cutting cycle time. And, as Gerald Tillett puts it, "It doesn't take long to chew up ten tires on a rough haul road. And ten tires pay for a motor grader."

Loading techniques are important too. Here again, specialized machines pay off. D9s with rippers insure fast loading of stubborn material; D9s with cushion dozers speed pushloading. Power shift transmissions better match the crawlers to their work and help increase production throughout a 10-hour shift.

SPECIALIZED LOADING

Every angle is watched to speed loading to match Tilletts' high production schedules. "We've got to keep dirt moving," Albert Jones, superintendent, told us. "We start ripping as soon as the loading slows down or the tires start spinning. (He's using a power shift D9 with straight-shank Cat Ripper.) This power shift D9 rips fast enough to stay ahead of all 14 scrapers—and that's going some! It's faster and cheaper than blasting . . . and it breaks up the material so it's easier to load."

The big D9 he's using has plenty of power to shatter tough rock, the ruggedness to stay on the job day after day. With split-second, no-clutch shifting, the operator can shift down for tougher going and right back up again (without loss of momentum) for faster ripping when conditions permit.

(Continued on next page)

TILLETT BROS.

(Continued from previous page)

Since shifting effort is so reduced, output is higher because the operator stays fresher, and ripping keeps scraper loading at maximum efficiency.

Every second in the pit is considered important. The Tilletts load down hill whenever possible; they tandem push when it will speed loading and cut their cost per yard. Recently they added another cost cutter—9C Dozers on their D9 Pushers. These inside-mounted, *cushion* dozers let the D9s swing in close behind the scrapers and make contact at *three miles per hour*, without jolting either machines or operators.

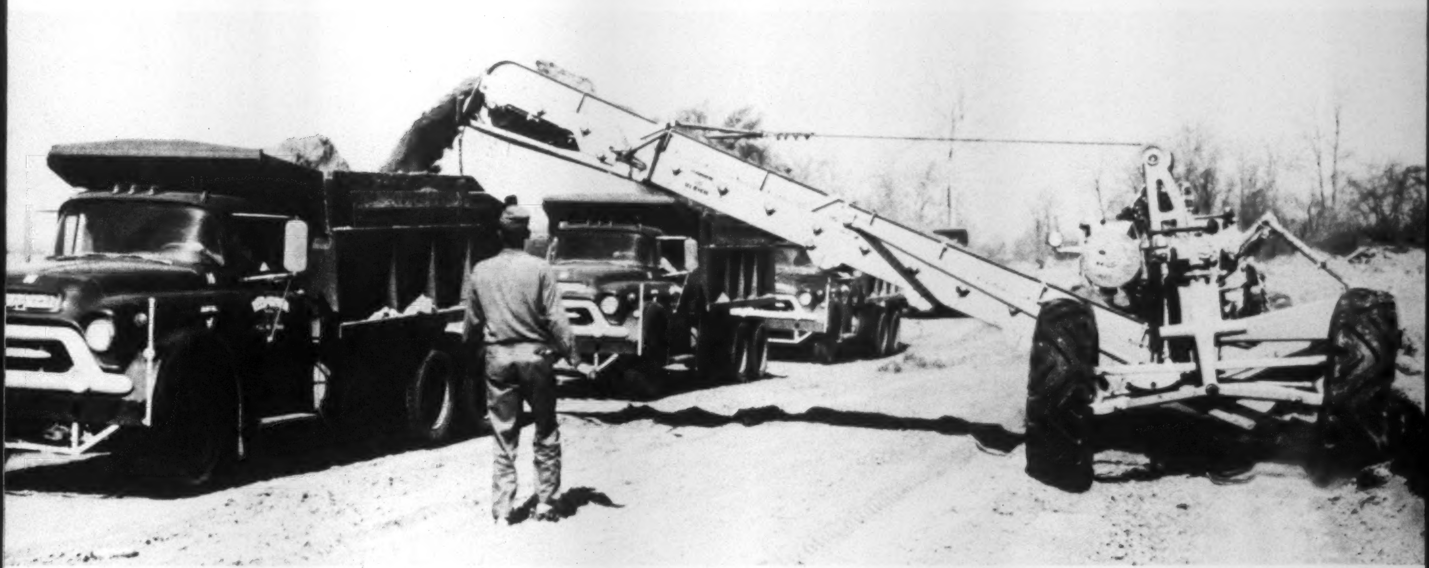
"This cuts 10 to 15 seconds off loading time," Gerald Tillett estimates. "These cushion dozers let us make fast contacts, using both pusher and scraper momentum to pick up loads faster. And we've still got a dozer to dress up the cut and hog out boulders. A smooth cut means our scrapers get through quicker." And on-the-go, up-and-down power shifting means haul units are boosted out faster, pusher gets in place faster for the next load.

THE RIGHT MACHINE PAYS OFF

Working machines as they do, you might expect maintenance costs to be high. On the contrary, the ease of servicing and maintaining Cat-built machines appeals to the Tilletts, too. They run their own maintenance shop on the job . . . find parts are always easy to get in a hurry from their Caterpillar Dealer. And his service department and field service are always available when needed. Operating costs are kept low by such things as lifetime lubricated rollers on the Cat track-type Tractors. Metal-to-metal seals keep lubrication in, dirt out . . . need no servicing until rebuilt. There is economy in their Cat Diesel Engines that operate on low-cost fuel—an important consideration when you're burning 1800-2000 gallons a day.

Joe Tillett explained their policies: "We buy Cat-built equipment because we're convinced it's the best in the business. And we trade 'em often to keep up with the latest improvements. (Typical of the whole Tillett operation, all machines on the Chattanooga job, except one Cat No. 12 Motor Grader, are less than three years old.) We pay the operator the same wages regardless of a machine's condition, but he can move more dirt when he has a good machine under him. We can't afford to have anything but the best equipment there is." That's the attitude of the Tilletts of Tennessee, an organization that in 12 years has grown from one used D6 to an 82-machine, million-dollar operation.

CAN YOU SPOT THE SAVINGS IN THIS PICTURE?



(Clue: it's a matter of adapting general-purpose equipment to a specialized situation)

This isn't the kind of earthmoving spread you'd expect to see on a job involving 1,300,000 yards of dirt. But the W. A. Smith Construction Co. of Kansas City, Mo., will tell you it works just fine, and that's what counts. The job is clearing the way for a new Missouri Pacific Railway Co. switchyard at North Little Rock, Ark.

Several methods were considered before the Smith Co. settled on this Cat No. 14 Motor Grader with Ulrich Domor elevating grader.

Scrapers, naturally, got consideration, but the haul—three miles one way over paved roads—ruled them out. A shovel would not have been fast enough. Another possibility was the use of a loader with a tractor to push and another to pull—but that looked like a hefty investment in equipment for a job as specialized as this.

So it narrowed down to the No. 14. How did production look? Promising. Faster than a shovel, not quite as fast as a loader-tractor team. But substantial savings on the investment in the No. 14 more than offset the modest production increase that would have been possible with the tractor-drawn loader.

And there was another important consideration that made the No. 14-Domor combination look even more attractive. Once the job was complete, the No. 14 would be ready to take on a wide range of routine jobs.

As it turned out, Smith's choice was a wise one. Despite poor footing with fairly high rolling resistance, production was high and profitable. With plenty of lug in its 150 HP turbocharged engine, the No. 14 with Domor kept up with the 19-truck spread easily. Power-boosted steering and leaning front wheels eased the operator's job, let him load 425 to 500 trucks in a ten-hour day. Loading costs per bank cubic yard were only 1.22¢.

Any method that gets dirt costs down so low is worth remembering. When you have to move a lot of earth in a specialized loading area, check out the No. 14-Domor elevating grader combination before you invest in other specialized equipment.

There's a good chance you'll get the production and cost combination you want—and no matter how tough the job, you can be sure that the No. 14 can stand up to it. Because it has such quality features as the exclusive Cat oil clutch (up to 2000 hours without adjustment) and triple box section main frame, you know that your No. 14 will be ready to take on plenty of other tough jobs in the years to come.

TRAXCAVATOR

They're doing a shovel's work with a Cat 977 Loader

If you think you need a shovel for a job but don't have the money to buy one—you could be in luck. Maybe you'll end up, like Roy Ables, with a machine that does a shovel's work at half the price! Here's how:

Back in 1957, Mr. Ables took office as road commissioner and convinced Lincoln County, Tennessee, that they'd be better off if they produced their own crushed rock, rather than depend on river run gravel. They'd get more select material for road maintenance and they'd be able to work all year 'round.

The only hitch was that he didn't get quite enough money. A crusher, a couple of trucks, impactor, compressor and drill ate up most of the $125,000 he was allotted. There wasn't enough left for the 1-yard shovel everybody thought he had to have to run the quarry.

That was about the time Caterpillar was introducing the new 977 Series E Traxcavator Loader and the Caterpillar Dealer suggested he try it in place of a shovel. It cost only half as much.

Most quarry men in the area scoffed at the idea. But the dealer was willing to let Mr. Ables try the 977 for a month—no strings attached. He did. And the loader is still on the job.

That 977 has spent about half its life in the quarry, handling 1000-1500 tons of shot rock a day. The rest of the time, it has been used out on the county roads for clearing and grading, and in stockpiling around the crusher.

The only repairs in over 4000 hours have been two broken idlers and two sets of bucket teeth. (The machine is equipped with a standard 2¼-yd. bucket.) There has been no track work needed on the machine, a credit to the good care Mr. Ables and his operator give the machine. The Cat oil clutch has 4130 hours of service and it has been adjusted only twice.

"In many ways," says Mr. Ables, "this 977 is better than a shovel. It can pick up oversize rocks and carry them off out of the way. And it is its own clean-up machine (a shovel would need another machine to keep the quarry floor clean)."

The current Series H 977 can outproduce the Series E machine by 50% or more on many jobs. The reasons the 977H can handle the work of a 1½-yard shovel in many applications are the power shift transmission and

at half the cost

the faster, more powerful hydraulics plus the exclusive automatic bucket positioners. In addition, when the work is intermittent, the loader can double on other jobs around the quarry. Most important, it does the work with a minimum of maintenance, yet costs only half as much as a shovel with comparable production.

Roy Ables is convinced of the merits of the Caterpillar track-type Loader in handling shot rock. He says, "When I need a new machine I'll get another Cat Loader, put it in the pit, and use this one on the road."

Check with your Caterpillar Dealer if you have a shovel job that might be handled by a Cat wheel or track-type Loader. He has the facts you need to make a sound decision that can save you money.

THE INSIDE STORY

How Cat Rollers Are Designed to Eliminate Maintenance and Give Longer Life

Simply stated, Cat lifetime lubricated rollers eliminate maintenance by keeping the lubricant in and dirt and grit out. There is no need to replace the lubricant—because it can't escape. There is no need to change the lubricant—because it can't get dirty. Hence, Cat rollers are maintenance-free until rebuilding time.

The chief reason for this maintenance-free performance is the exclusive Caterpillar floating ring seal, illustrated at right.

Each seal consists of two metal floating rings of a hard alloy. The inner surfaces of the rings are finished to a mirror-like smoothness and fit so perfectly that it is practically impossible for lubricant to get out or grit to get in.

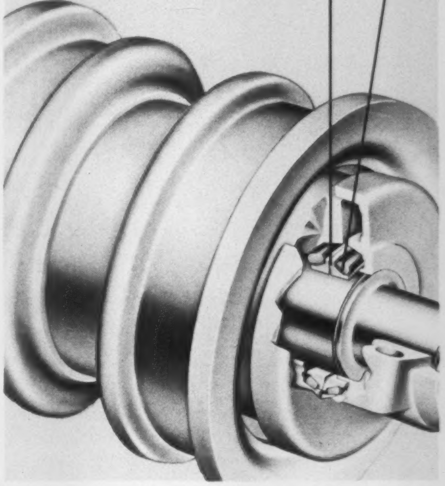
In addition, synthetic rubber "O" rings behind each floating seal keep even, constant pressure on seal surfaces and can take extreme shock loads without leaking.

Cat roller seals are noted for long life and for reusability at rebuild time. One example is a contractor in the West whose rollers were rebuilt at 5700 hours. Seal wear was only 35%—so small that they could be reused.

The same reusability is characteristic of the bushing type bearings found in Cat rollers. These bearings have greater load-carrying ability than ordinary bearings and can normally be reused when the rollers are rebuilt.

Freedom from time-consuming lubrication maintenance is only one advance of the new Cat rollers. Higher hardenability steel also strengthens each track roller for longer life. More steel under the rim load area gives greater support and resistance to peening. Shafts have larger diameters with increased beam strength.

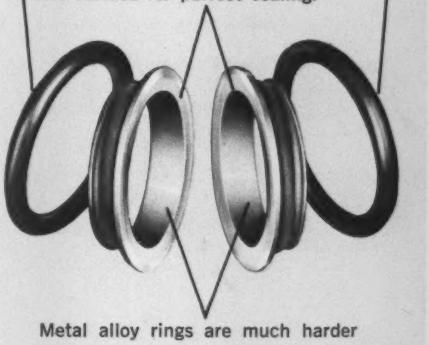
Caterpillar lifetime lubricated rollers are standard on the D9, D8, D7, D6 and D4 Tractors and the 977, 955 and 933 track-type Loaders.



HOW IT SEALS

"O" rings maintain a constant load on metal rings.

Lapped surfaces of metal rings prevent passage of lubricant or grit.



FLOATING RING SEAL

Special synthetic rubber "O" rings are resistant to oil, heat (up to 200° F.) and cold (down to –40° F.).

Seal surfaces are lapped to mirror-like surface for perfect sealing.

Metal alloy rings are much harder than the best file steel—are rust and corrosion proof.

Special report to users of Caterpillar equipment

CAT CATERPILLAR

Parts you can trust
... cost less per hour

New Cat parts stretch dollars "down where the digging's going on"

That's more than just talk! More and more users are conducting their own field trials of ground engaging tools—tips, bits, teeth and edges—to determine which brand gives them the best performance-cost balance. And time after time, they find that genuine Caterpillar ground engaging tools outclass all comers—in production and over-all economy!

Take Cat cutting edges. These edges have been contractor-tested with most of the market's leading brands all over the country. Results: Cat edge wear life—10-60% longer. Cat edge cost—15-50% less per hour. Think of that in terms of dollars!

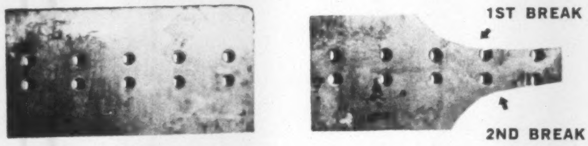
HERE'S A LOOK AT RECENT FIELD TRIALS ON SCRAPER CUTTING EDGES:

Two DW21-470 Scrapers, one with Cat *standard* edges and one with popular brand *thick* edges, were put to work "side-by-side" by a contractor in hard, red clay on an Interstate Highway job. His findings:

Brand	Price	Hours of Life	Cost per Hour
Other	$121.22	1060	$.114
Cat	$128.28*	1360	$.094

HIS SAVINGS WITH CAT EDGES—17.5% PER OPERATING HOUR

*Test completed before recent new low price of $102.30 effective.



CATERPILLAR OTHER BRAND

A Cat ⅞" stinger and another brand *one inch thick* were split in half and a section from each installed on *same* DW21-470 Scraper working in decomposed lava with embedded basaltic boulders. Other brand section broke after 48 operating hours, was reversed but broke again two hours later—a total of 50 hours of life. Cat *edge wear during period was ¼", other brand ½"*.

Your Caterpillar Dealer has the facts on many of these tests—go over them with him and start to save more now.

Caterpillar continually up-dates its line of ground engaging tools. Some of the newcomers to the line that "stretch your dollars" are: new self-sharpening end bits and ripper tips, patented reversible router bits, and new-design scarifier teeth for Motor Graders. These new money-savers keep production high, costs down.

For the best in new and used machines, and the best in parts and service—see your Caterpillar Dealer

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

Men and Jobs

Col. Frye Named Engineer For South Pacific Division

Col. Arthur H. Frye, Jr., has been appointed South Pacific Division Engineer, U. S. Army Corps of Engineers, effective September. He succeeds Brig. Gen. Robert C. MacDonnell, who will be transferred to a new assignment in the Office of the Chief of Engineers in Washington, D. C. Headquarters of the South Pacific Division is San Francisco.

For the last year Colonel Frye served as Deputy Director of Military Construction in the Office of the Chief of Engineers in Washington. Before that he was Assistant Chief of Staff and Deputy Engineer, U. S. Army in Japan. From 1953 to 1957 was Los Angeles District Engineer.

A graduate of the U. S. Military Academy, with a graduate degree in engineering from Iowa State University, Colonel Frye served in the Mediterranean and European Theaters during World War II. He later graduated from the Army War College.

Briefs . . .

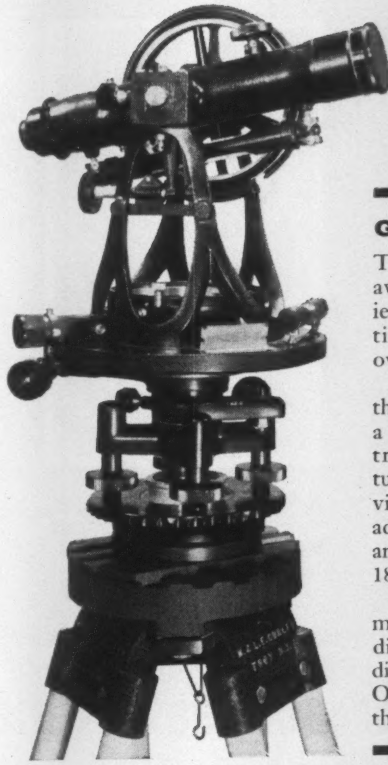
Education

Robert W. Van Houten has been elected president of the American Society for Engineering Education. Mr. Van Houten, head of the Newark, N. J., College of Engineering, succeeds Eric G. Walker, president of Pennsylvania State University.

John J. Gallen has been named acting head of Villanova University's Division of Engineering. Mr. Gallen, who presently heads the civil engineering department, succeeds the late J. Stanley Morehouse.

Col. Stanley G. Reiff, retired division engineer for the Corps of Engineers' Southwestern Division, has taken a teaching position at Texas Christian University in Dallas. He became division engineer in 1960 and retired last May.

Robert M. Holcomb, professor at Texas A & M College, has been appointed dean of the SEATO Graduate School of Engineering at Bangkok, Thailand. He succeeds **T. H. Evans,** who has returned to Colorado State University. **Robert T. Banks,** assistant dean for research and graduate studies at Northwestern University, has been named director of research of the school, which is operated by the Colorado State University Research Foundation under contract with the International Cooperation Administration. He succeeds **Marion R. Carstens,** who has returned to Georgia Institute of Technology.



A Guide to OP and VP

Gurley Optical Plummet

The Optical Plummet Transit opens new avenues in accuracy, speed and convenience...eliminates inconvenience and lost time involved in centering a plummet over a point.

The Optical Plummet is a telescope through the vertical center (spindle) of a transit. It will point vertically when the transit plate is level. The telescope is turned at right angles by a prism, so that vision is actually horizontal. Setting and adjustment may be checked very simply and precisely by rotating the instrument 180 degrees.

The Gurley Shifting Head Tripod permits 1¾" movement of the transit in two directions 90° separated, without material disturbance to the level of the plate (the Optical Plummet thus remains operative through the entire centering procedure).

Advantages of the Gurley Optical Plummet Transit

- Saving in set-up time, as much as 33%—a factor when a crew is waiting.
- Eliminates swaying plumb bob.
- More accurate centering over point.
- On construction work—sights on points some distance below, such as encountered in bridge work and building construction.
- Made in U.S.A.—Little servicing, but easily repaired when necessary.

Gurley Optical Plummet Transits Available in 21 Combinations

With Circular Compass	With Trough Compass	Without Compass
OP-52	—	OP-57
OP-62	—	OP-67
OP-132	OP TC 137	OP-137

Variable Power is standard on Gurley Transits and Levels:

VP

- Wide range of magnification with **one** eyepiece—zooms for near or distant objects
- Easily adjusts to suit weather and light conditions
- Built-in haze filter

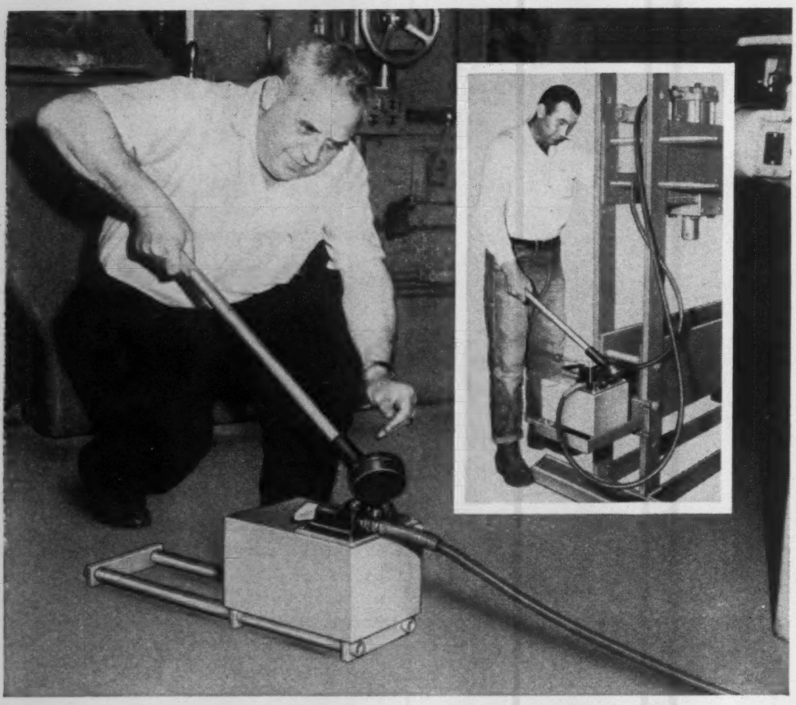
At high power:
- longer shots
- less glare in bright sunlight
- increase in readability
- no glare... high contrast
- blacks and whites stand out

At low power:
- greater field
- brighter field
- decrease of heat waves

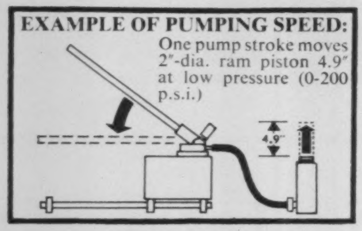
We will be pleased to send you further information about both Gurley Optical Plummet Transits and Gurley Variable Power Eyepiece.

Both Optical Plummet and Variable Power are patented.

W. & L. E. Gurley • Union Plaza, Troy, N. Y.

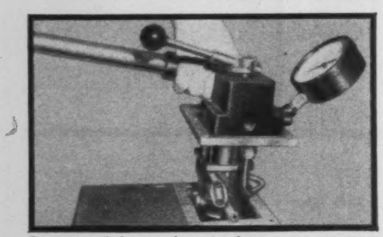


Get fast ram approach, save time with new 2-speed hydraulic pump


EXAMPLE OF PUMPING SPEED:
One pump stroke moves 2"-dia. ram piston 4.9" at low pressure (0-200 p.s.i.)
4.9"

- Delivers a big 7.35 cu. in. of oil per stroke at low pressure (0 to 200 p.s.i.)
- Delivers .294 cu. in./stroke from 200 to 10,000 p.s.i. for high force requirements
- For operating both single and double-acting cylinders

Here is a compact, precision-built 10,000 p.s.i. 2-speed hand pump with the ability to deliver exceptionally high volume at low pressure for fast ram approach and return. Handle high-force requirements, yet waste no time getting the ram to the work! Choice of 2-way or 4-way control valve, mounted easily on cover plate; no exposed piping. Unit weighs only 34 lbs.



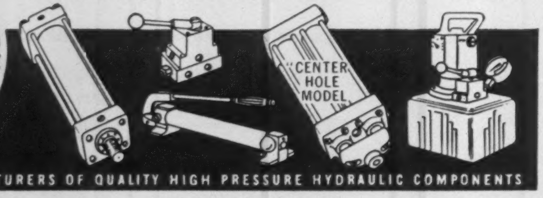
Pump, valving and controls mount on common cover plate; use with other reservoirs.

Ask your OTC distributor about the new OTC "Dualmaster" pump.

PRECISION HYDRAULICS DIVISION

RESEARCH · ENGINEERING · DEVELOPMENT
OTC

OWATONNA TOOL CO.
370 CEDAR ST., OWATONNA, MINN. CABLE: TOOLCO



DESIGNERS AND MANUFACTURERS OF QUALITY HIGH PRESSURE HYDRAULIC COMPONENTS

Public Works

The Delaware Highway Commission has appointed **William J. Miller, Jr.,** director of operations for a five year term. Except for four years in the Army, Mr. Miller has served the highway department for 25 years as traffic and planning engineer, deputy engineer and acting chief engineer.

David E. Cohen, an attorney from East Chicago, Ind., is the chairman of the New Indiana State Highway Commission appointed by Governor Matthew Welsh. Other members of the four-man commission are: **Edward S. Furnish,** a tobacco co-op official from Vevay, Ind.; **Hugo A. Weissbrodt,** Fort Wayne industrial consultant; and **Charles M. Dawson,** a holdover from the last commission.

Charles W. Kenney has been appointed assistant administrator of the Department of the Interior's Bonneville Power Administration, headquartered in Portland, Ore. He is presently Special Assistant to the Director of Civil Works, Office of the Chief, Corps of Engineers.

Business

Sydney Barnes, partner in Barnes and Holden, consulting engineers with offices in New Castle, Del., has been elected chairman of the newly formed Delaware Association of Consulting Engineers. The group has as members about 80% of the state's registered and incorporated consulting engineers.

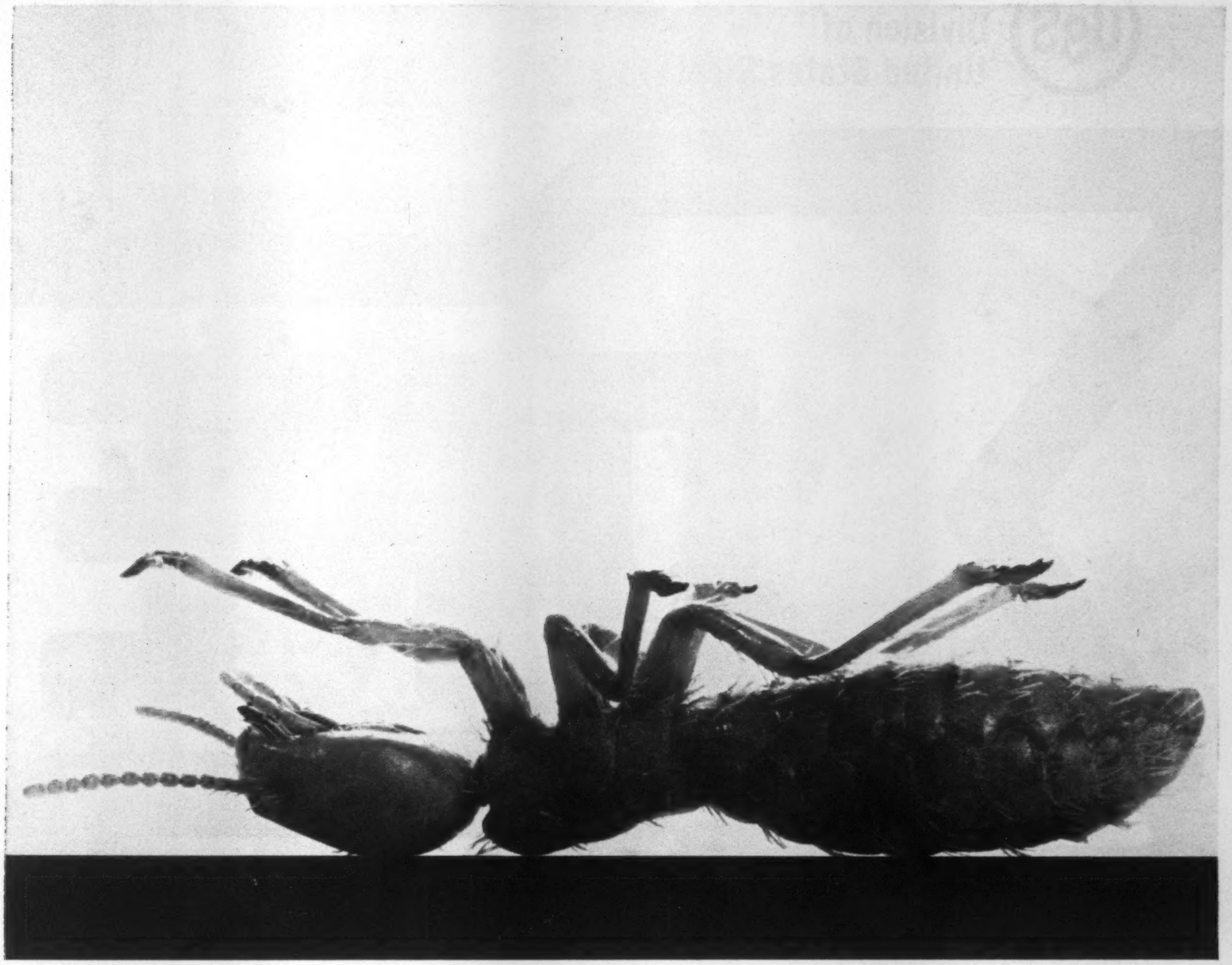
The engineering department of Fruin-Colnon Contracting Co., St. Louis, has been expanded into a subsidiary engineering company, named Fruco & Associates. President of the new company is **A. A. Pierson,** former executive vice president of the parent company.

Rear Admiral J. F. Cunniff, retired from Navy's Civil Engineering Corps, has been appointed resident engineer on a new drydock construction in Portland, Ore. He will work for Frederic R. Harris, Inc., New York, the consulting engineers who have the contract.

Associations

Vincent DeMase, director of the building inspection department of Providence, R. I., has been elected president of the Rhode Island Building Officials Association. He is a past national director of the National Society of Professional Engineers and a past president of the Rhode Island Society of Professional Engineers.

Arthur J. McNair, professor of civil engineering and head of the surveying department of Cornell University, has been elected president of the American Society of Photogrammetry.



Coal Tar Creosote stops decay of your wood structures

What causes the deterioration of untreated wood structures? Wood preservation specialists will tell you the three major causes are insect attack, fungus decay and marine borers. Each of these destructive agents takes a toll in millions of dollars of improperly protected wood structures each year. Wood preservation specialists will also give you proof that structures built of pressure-creosoted wood have established service records of 40, 50 and even 60 years without deterioration. The reason is that coal tar creosote provides treated wood with complete resistance to attack. Equally important, each of creosote's 162 basic chemical ingredients is effective against wood destroying agents. For fencing, piling or wood construction of any kind, you'll find that pressure-treatment with Koppers coal tar creosote offers the answer to long wood service life.

KOPPERS

KOPPERS
TAR PRODUCTS DIVISION

District Offices: CHICAGO • LOS ANGELES • PITTSBURGH • NEW YORK • WOODWARD, ALABAMA

American Steel and Wire
Division of
United States Steel

There's only one way to rebuild a city right. Start from the streets up. If you're involved with urban redevelopment, you're playing for keeps because the costs are enormous and must be financed over a long period. You can't afford to have public works deteriorate before they're paid for, including city streets. Keep this in mind: the longest-lasting streets are reinforced with welded wire fabric.

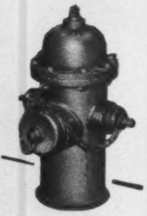
Concrete pavement slabs are the prey of variations in temperature, moisture, soil movement and traffic. Concrete provides the necessary compressive strength to combat cracks, but lacks tensile strength. Steel welded wire fabric delivers the tensile strength needed to prevent progressive opening of cracks and to safeguard the slab's load-carry-

ing capacity. Streets that are reinforced with welded wire fabric have a balanced design that protects edges and corners. Load is distributed evenly throughout the slab and stresses are reduced 30%.

USS American Welded Wire Fabric is your best way of making sure your streets will still be safe and smooth years from now. It is precision-made from cold drawn, 60,000 psi minimum yield strength steel wire to your exact size and style requirements, ready for immediate placement. For full information about USS American Welded Wire Fabric, or for technical assistance, write American Steel and Wire, Dept. 1209, Rockefeller Building, Cleveland 13, Ohio. Innovators in Wire.

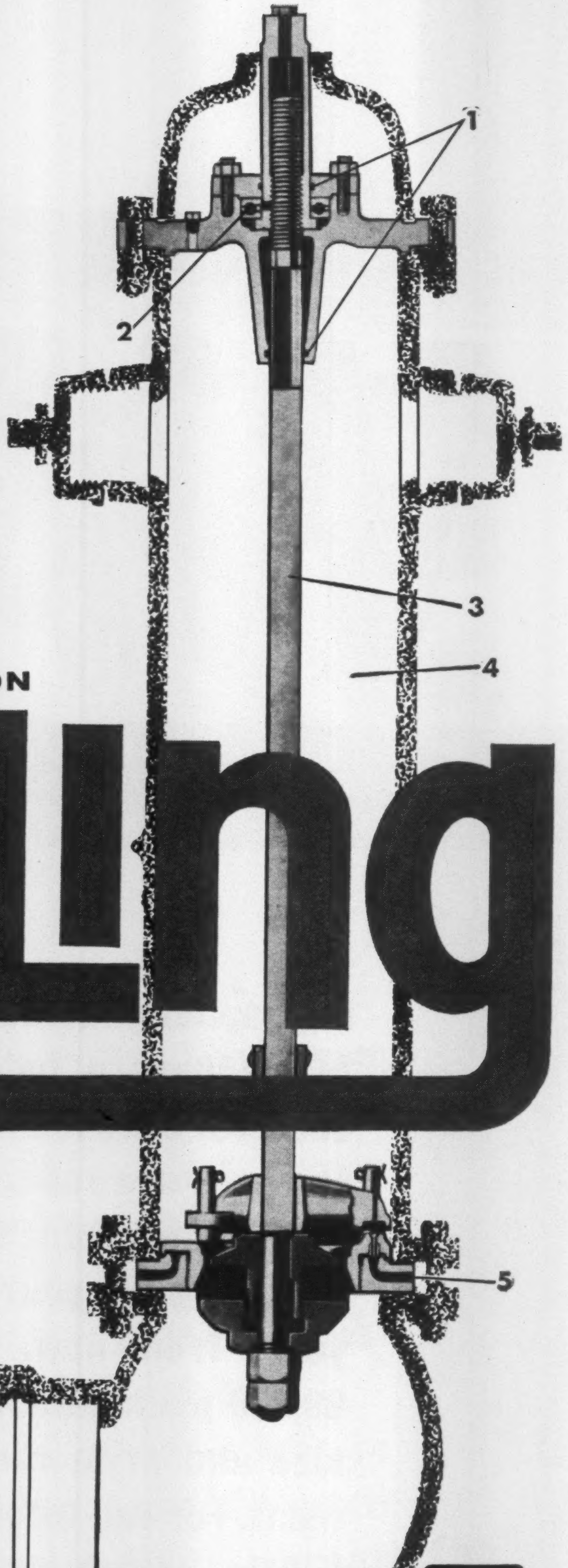
USS and American are registered trademarks

Darling B-50-B Hydrants are built for exceptional service



YOU CAN DEPEND ON

Darling



Packless "O" ring seals (1) cut friction while assuring complete, permanent lubrication of operating mechanism. Ball bearings (2) reduce operating torque up to 50%. Direct-acting rod (3) operates the main valve and drain valve without auxiliary components.

An extra large barrel (4) delivers water at the nozzles without appreciable pressure loss. Multi-port draining (5) with positive flushing makes stoppage or freeze-ups virtually impossible . . . *you can depend on Darling.*

Darling B-50-B Hydrants are available in types and sizes for practically every installation. Write for Bulletin 5710.

DARLING VALVE & MANUFACTURING COMPANY
Williamsport 34, Pa.

The Canada Valve & Hydrant Co., Ltd., Brantford 7, Ontario, Canada
Vannes Darling-France, 23 rue du Commandant Mouchotte, St. Mandé, France

GATE • BUTTERFLY • CHECK • SPECIAL VALVES • FIRE HYDRANTS

TRADE
DARLING
MARK

Obituaries

Michael J. Fidance, 67, chief building inspector for Wilmington, Del. He had been building inspector for 27 years. Before that he was resident engineer on road construction for the Delaware Highway Department.

Charles L. Motl, 75, a consulting engineer with Charles M. Upham Associates of Washington, D. C. Before joining Upham in 1955, he was maintenance engineer for the Minnesota Highway Department.

Trygve Masseng, 67, owner of T. Masseng & Associates, consulting engineers of Louisville, Ky. He was president of the Kentucky Association of Consulting Engineers.

David M. Simon, 69, a partner in Simon Brothers, New York City builders of high-rise apartment houses. He joined the company, which was founded by his brothers, in 1925. Since then it has built more than $200 million worth of apartment houses and office buildings in Manhattan.

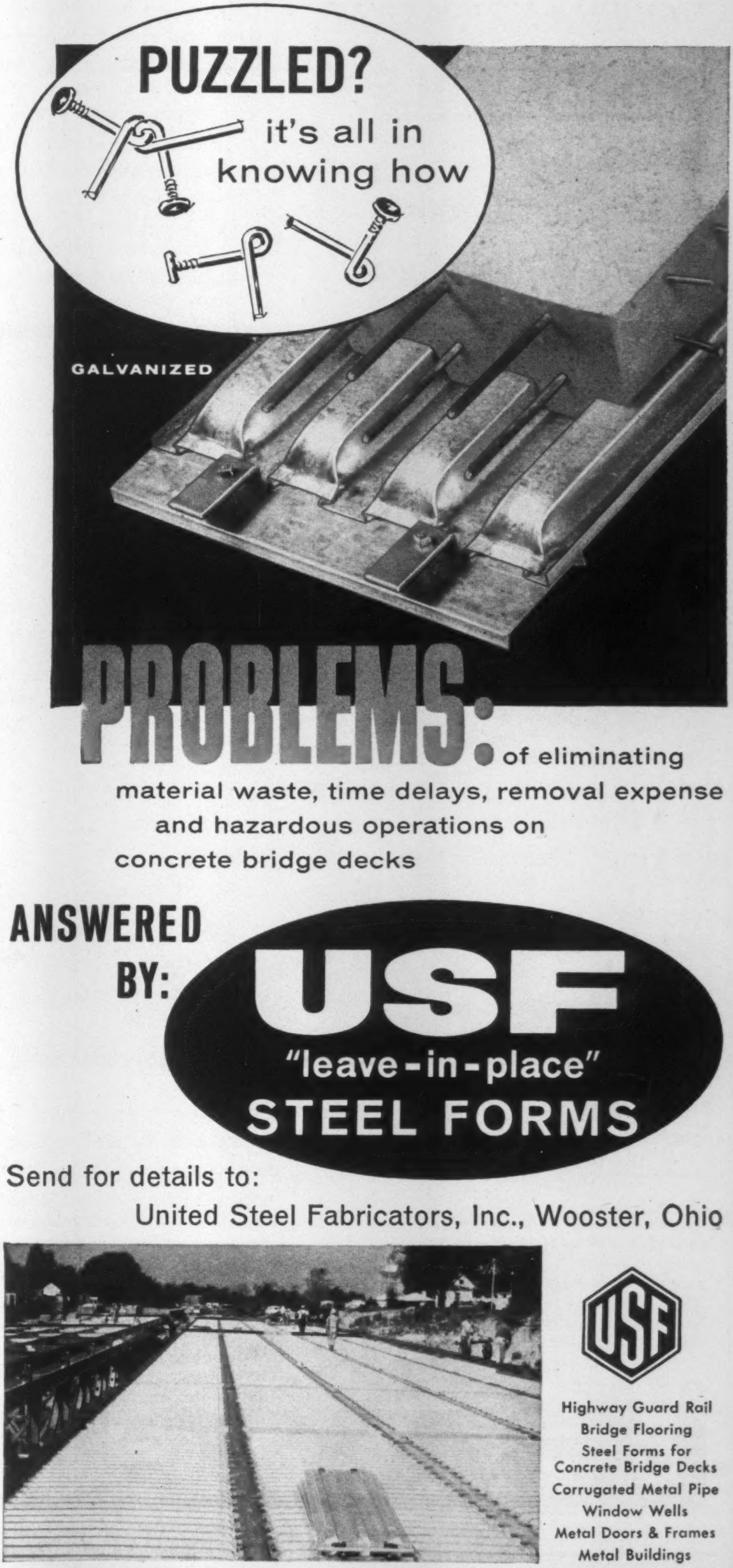
Roscoe P. McClave, 80, founder, with his brother, of McClave & McClave, civil engineers in Cliffside Park, N. J. Mr. McClave was founder and first president of the Association of Professional Engineers. He held civil engineering license No. 1 in New Jersey.

Frank K. Thompson, 89, retired senior civil engineer and construction superintendent for the War Department construction division. For ten years before his retirement in 1942 he supervised all permanent construction and engineering work at both Fort Bragg and Pope Air Force Base in North Carolina.

Henry P. Ernst, 69, architectural specifications consultant and lecturer in the Architectural Department of Illinois Institute of Technology in Chicago. Before going into private practice, Mr. Ernst was chief of specifications at Pace Associates, Chicago architects.

George A. Taylor, 86, partner in Sanzenbacher, Morris and Taylor Co., Toledo consulting engineers. He retired from active participation in the company ten years ago.

Duncan F. McGugan, 74, a civil engineer on the Ontario Hydro-Electric Power Commission since 1929. He was a negotiator for the Power Commission on the St. Lawrence Seaway Project.


PUZZLED? it's all in knowing how

GALVANIZED

PROBLEMS: of eliminating material waste, time delays, removal expense and hazardous operations on concrete bridge decks

ANSWERED BY: USF "leave-in-place" STEEL FORMS

Send for details to:
United Steel Fabricators, Inc., Wooster, Ohio

USF

Highway Guard Rail
Bridge Flooring
Steel Forms for Concrete Bridge Decks
Corrugated Metal Pipe
Window Wells
Metal Doors & Frames
Metal Buildings

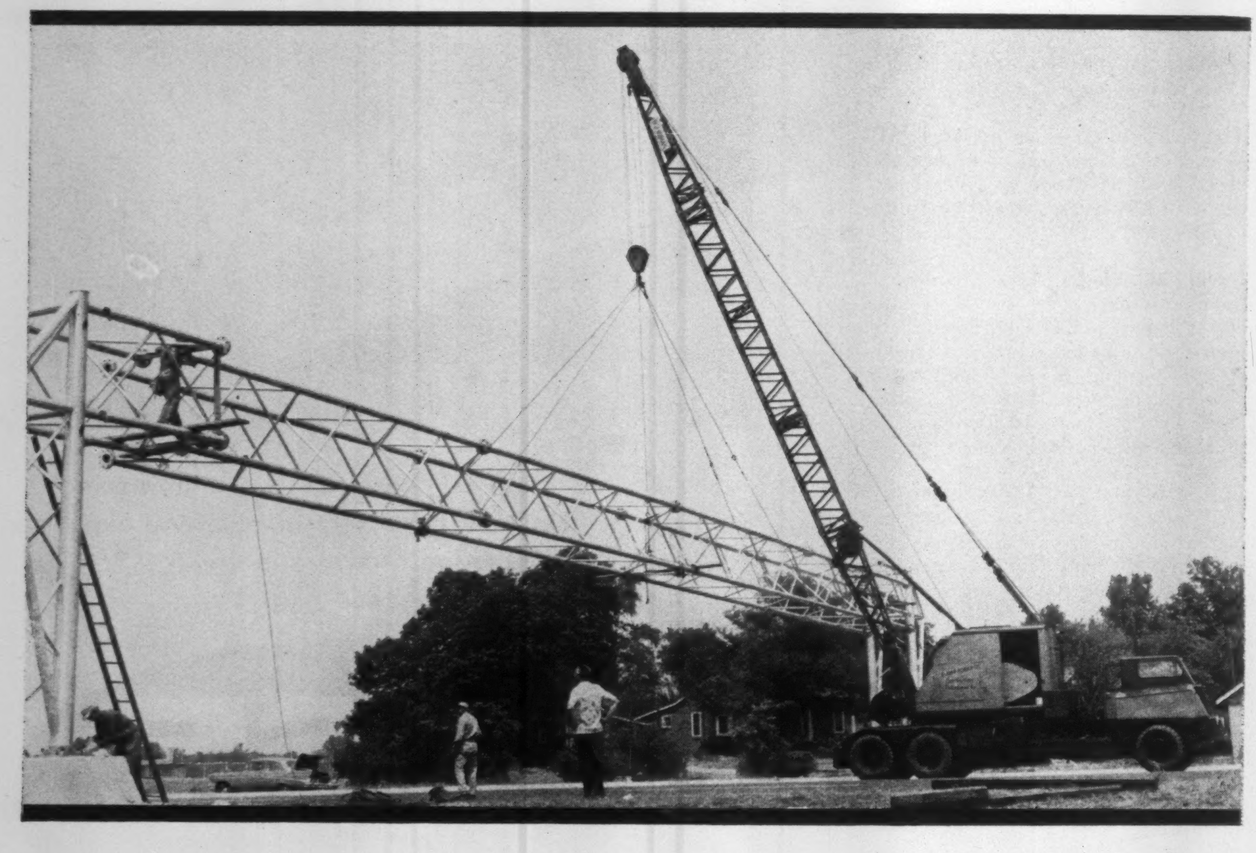
NO TRAFFIC JAM

CRANEMOBILE®

Makes Lift . . . 6 Minutes Later Traffic Flows Again

The overhead support being erected here by the H. John Homan Co., Collingswood, N. J., for the Delaware River Bridge Authority, will carry directional signs for eight traffic lanes. While work was in progress, all traffic was halted — but, not for long. From the time Homan's 30-ton CRANEMOBILE moved into working position until the support was fastened, only six minutes had elapsed.

You'll find a CRANEMOBILE brings you the finest combination of advantages available for fast, safe lifts. Setting-up is exceptionally quick. Pin-connected boom sections permit rapid change of boom length. With hi-gantry and powerful independent boom hoist, boom and jib are raised from travel to working height without outside assistance. Extendible outriggers are quickly set.



In action, CRANEMOBILE load control is unmatched. With boom hoist independently power-operated, the crane operator raises or lowers boom or boom-and-load simultaneously with any other operation. A load-lowering device that's quickly engaged or disengaged handles the lowering of heavy loads smoothly and with precision. A heavy-duty, smooth-operating swing brake offers finest drift control; the operator swings the load into position . . . HOLDS that position exactly.

CRANEMOBILES are available in 25-, 30-, 35-, and 40-ton sizes . . . are mounted on specially designed BAY CITY-built 6 x 4 or 8 x 4 carriers. **For detailed information and the name of your nearest dealer, write today.**

BAY CITY

SHOVELS, INC.
2611-B Center Ave.
BAY CITY, MICHIGAN

a subsidiary of Unit Crane & Shovel Corp.

Location of Industrial Sites

Industrial Districts Restudied—Technical Bulletin No. 41—By Robert E. Boley. 77 pages. (Paper covered.) Urban Land Institute, 1200 18th St., N. W., Washington 6, D. C. $5.

Industrial districts are market oriented. Most are located in suburban areas, within ten miles of the central city. They are close to major highways. Two-thirds of them occupy 50 to 100 acres, the most frequently recurring size being 100 to 200 acres. Coverage of the site by buildings is relatively small.

This is the picture drawn of industrial districts in the U.S. and Canada in a report prepared for the Industrial Council of the Urban Land Institute. It is a follow up to the Council's 1952 report, "Planned Industrial Districts, Their Organization and Development" —Technical Bulletin No. 19.

An industrial district, says the Council, is any area dominated by industrial activity. But where an area incorporates a deliberate allocation to restricted use, coupled with proprietary control, its designation takes on special significance. Such an area may be called a planned or organized industrial district.

Theoretically, an industrial park is a highly restricted type of planned industrial district, where special emphasis is placed on esthetics and community compatibility. But in many instances, "the term is nothing more than a semantic gimmick used to gain community acceptance on the one hand and to promote a piece of real estate on the other," the 1961 report points out. Gradations in the degree of planning, development standards and administrative control are so varied that the report's author was unable to differentiate between planned industrial districts and industrial parks.

The report presents and analyzes data from 272 industrial districts, with special attention to sponsorship and its relation to location, size and occupancy characteristics. It also compares site sizes, site coverage ratios, employment ratios, employment per establishment and employee densities of manufacturing and nonmanufacturing occupants.

Among the more significant conclusions of the study are the following:

- Most frequently, occupants require distribution facilities or plants for light manufacturing, with sites from one-half to five acres and buildings of 10,000 to 25,000 sq ft. A firm needing more than 25 acres rarely located in a planned industrial district.
- The shallower the site depths, the greater the loss of gross area and the higher the development costs. As a rule, a developer can expect to lose between 10% to 25% of gross area to rights-of-way and easements.
- Buildings usually occupy only 20% to 50% of the site area. Seldom does coverage exceed 60%.
- Plants in two-thirds of the districts employ fewer than 50 persons per establishment. Densities are less than 20 persons per site acre.

The report is valuable in giving an up-to-date picture of contemporary industrial districts. But it describes them as they are, not as they should be.

Lath and Plaster Manual

Manual of Lathing and Plastering—by John R. Diehl. 384 pages. National Bureau for Lathing and Plastering, 200 K St., N. W., Washington 6, D. C.

"One of the most imposing challenges to the architectural and engineering professions is to keep abreast of the constantly changing materials, systems, ratings and techniques in the design and construction of better, safer shelter."

This comment in the foreword to a diagram and picture-laden manual states the book's well achieved objective. And it indirectly challenges other branches of the building industry to produce the same sort of comprehensive reference.

The book is thorough; contractor, labor union and manufacturing groups pooled their information and knowledge to produce it. The opening chapter on architectural considerations jumps from historical commentary into a design critique on past, present and expected future work in the trade and art. In another chapter, there's a careful listing and description of every type of plastering tool from plain trowels to mechanized plastering machines.

Between the two extremes, the manual offers chapters on materials and assemblies, preparation and application, functions and quality of work, economics and acoustics. The ninth and last chapter covers fire resistance in building construction and includes handy data for owners, designers, and builders. Inspection and rating organizations, definitions and a short glossary are listed here. What the glossary lacks, a long and detailed index covers. While the prose is sometimes heavy, the thoroughness of the manual makes it an essential reference in any designer's or builder's library.

LOOK 'UM
AT PAGES
52,53

The QUICKEST way to get

Reinforced Concrete Designs | Revised 1961 . . . Second Edition . . . Fourth Printing

over 80,000 copies in use

over 500 pages

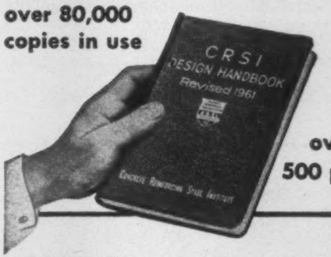
Reinforced Concrete Designs worked out in accordance with the latest A. C. I. Building Code. Fourth printing includes new column design tables using special large-size bars, #14S and #18S, in 60,000 and 75,000 psi yield point steels, plus additional information on Waffle Slabs. Send check or money order.

Prepared by the Committee on Engineering Practice

$6.00 postpaid

10-Day, Money Back Guarantee
NO C.O.D. ORDERS

CONCRETE REINFORCING STEEL INSTITUTE
38 S. Dearborn St. (Div. D), Chicago 3, Illinois



CONSULTING ENGINEERS:

Get your copy of this Plans Portfolio for Bethlehem Girder and Girder Guard Rail

If you work on projects involving port design, piers, dockwork, industrial plants, or any other situations where railroad track is installed in pavement, you will find this new Bethlehem portfolio a very handy reference.

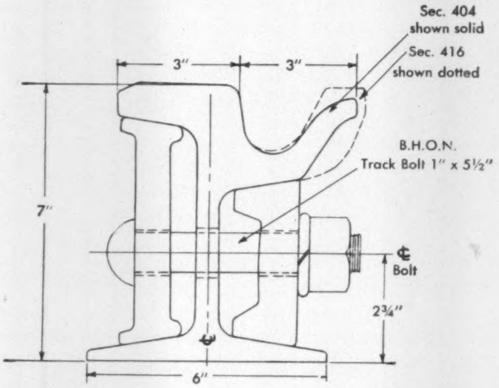
Girder Rail Has Built-In Flangeway

In its 24 pages of detail and alignment plans you will find just about all you'll need for designing with Bethlehem Girder and Girder Guard Rail, a rail section specifically developed for use in paved areas. Girder rail has its own flangeway rolled right into the section, making it unnecessary for you to improvise flangeways alongside the railhead.

The companion section, Bethlehem Girder Guard Rail, is a variation of the basic section which is used opposite frogs and on sharp curves. Both the Girder Guard and the Girder sections can be spiked down over tie plates and wood crossties, or held down with anchor bolts, rail clips, and tie plates.

We Can Do Engineering and Fabricating

Bethlehem Girder Rail sections are very effective in protecting the paving from chipping and spalling. We are equipped to do all fabricating right in our Steelton, Pa., plant where the rail is rolled. We also include engineering, fitting, aligning, and match-marking of pieces before shipment to the job-site.



Bethlehem produces two girder rail sections (7 in. and 9 in.) to the standards of the ASTM. Shown above is Section 404, 128 RE 7A Girder with Section 416, 149 RE 7A Girder Guard Rail. Also available is Section 408, 159 RE 9A Girder Rail, and its companion Section 409, 174 RE 9A Girder Guard Rail. Turnouts and other necessary components are available for both sections.

• • • • • • • • • •

Send For Your Copy of Detail Portfolio

Our new portfolio gives useful data on turnouts, frogs, tongue switches and mates, tie plates, clips, and other pertinent accessories. We will gladly back it up with engineering help. Use the coupon below.

BETHLEHEM STEEL COMPANY
ROOM 1041, BETHLEHEM, PA.

Please send me_____copies of your
Girder Rail Detail Portfolio.

Name______________________________

Firm______________________________

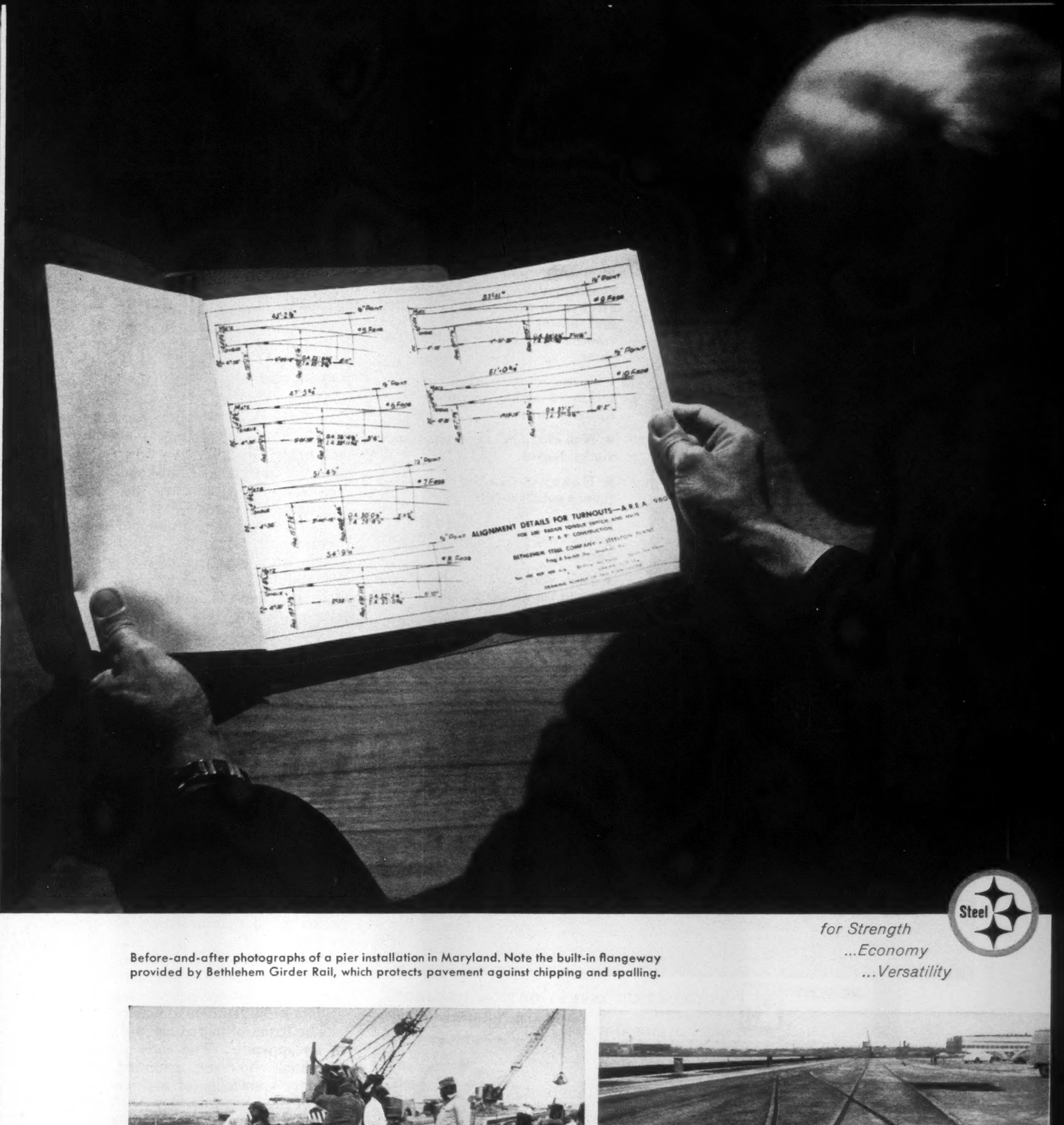
Address___________________________

City & State________________________

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Sales: Bethlehem Steel Export Corporation

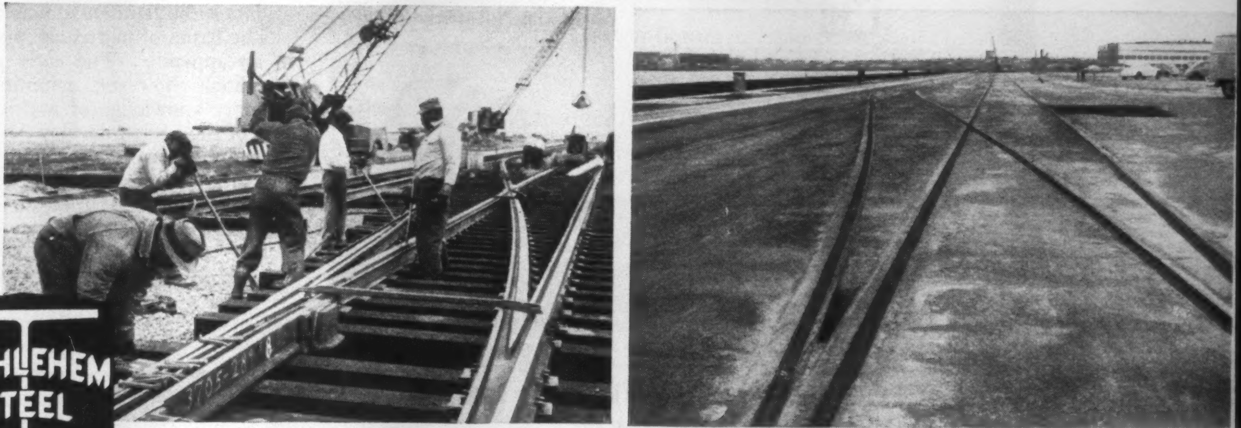
BETHLEHEM STEEL


ALIGNMENT DETAILS FOR TURNOUTS—A.R.E.A.
BETHLEHEM STEEL COMPANY • STEELTON PLANT

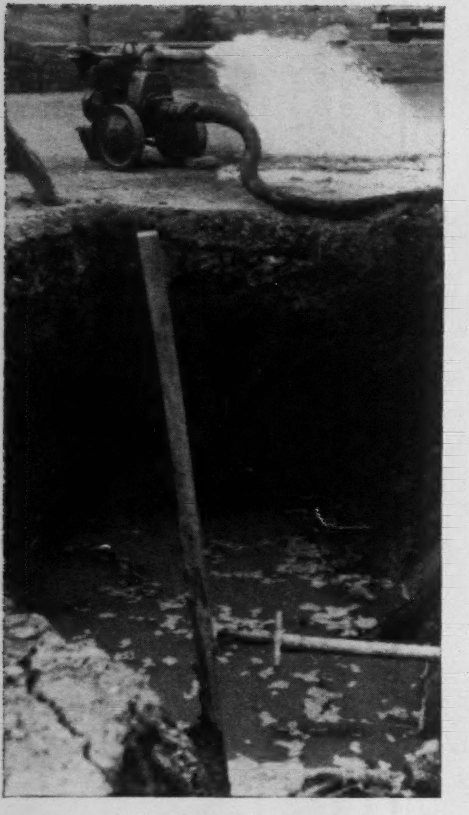
Steel

for Strength
...Economy
...Versatility

Before-and-after photographs of a pier installation in Maryland. Note the built-in flangeway provided by Bethlehem Girder Rail, which protects pavement against chipping and spalling.



BETHLEHEM
STEEL



JAEGER PosiJector TRASH PUMPS

- New 3″ and 4″ self-priming centrifugals pass and positively eject trash while pumping 20,000 and 46,000 gph. Highly efficient whether pumping dirty water or clean.
- "PosiJector" prevents recirculation of solids, channels them into discharge flow.
- Non-clogging strainer passes sticks, leaves.
- Heavy 2-bladed impeller passes solids to 2″.
- Suction chamber unbolts for quick inspection, adjustment, cleaning.
- Ask your Jaeger distributor or send for Catalog PT-1.

THE JAEGER MACHINE CO.
Columbus 16, Ohio

PHILCO CORPORATION RESEARCH CENTER

RECENT S&H FOUNDATION INVESTIGATION PROJECTS IN THE PHILADELPHIA AREA

ALLSTATE INSURANCE COMPANY OFFICES

Photos courtesy of: The Ballinger Company • Architects and Engineers • Philadelphia, Pa.

SPRAGUE & HENWOOD, Inc. S&H
SCRANTON 2, PA.
New York • Philadelphia • Nashville • Pittsburgh • Tucson • Salt Lake City • Buchans, Nfld.

Essence of Fluorescence

FLUORESCENT LIGHTING MANUAL—3rd Edition, by Charles L. Amick. 400 pp. McGraw-Hill Book Co., New York, London, Toronto. $12.50.

Changes in fluorescent lighting techniques called for up-dating this manual. But the latest edition retains the hard-kernel purpose of the original edition: "to provide a ready and practical reference source giving the various types of information needed to design, sell, install and service fluorescent light installations."

With the engineer, contractor and salesman in mind, Mr. Amick offers a clear coverage of the principles and procedures for calculating illuminating needs, the design of luminaires and auxiliary equipment, and the practical methods of maintenance and repair. Full treatment is given to the economics of lighting, color qualities and trouble shooting.

The latest advances in wiring methods, materials and control devices, plus high and extra-high-output lamp developments are also treated. Ample illustrations and charts supplement the written text, and the appendix offers a listing of the current footcandle recommendations of the Illuminating Engineering Society.

Stresses in Frames

FRAME ANALYSIS—By A. S. Hall and R. W. Woodhead. 247 pp. John Wiley & Sons, Inc., New York and London. $8.50.

Structural engineers who wish to use high-speed electronic computers for frame analysis will find this book useful both for study and reference. It shows how matrix algebra can be applied profitably to determination of stresses in frames.

Matrix algebra is a technique particularly suitable for solution by computer, for matrices permit large blocks of data to be handled concisely.

The basics of matrix algebra are given in an appendix. The early portion of the book, however, assuming a rudimentary knowledge of matrices on the part of the reader, develops matrix equations in longhand form and gives the short form as an alternative. Later chapters place more reliance on matrix expressions.

The authors, members of the civil engineering department, University of New South Wales, Australia, develop frame analysis from two viewpoints—flexibility and stiffness. They show these to be reciprocal approaches. They also present other methods to show that these are variants of the two main methods.

CHEMICAL BANK NEW YORK TRUST COMPANY

Built faster ...earned $112,000 extra ...with STEEL

STEEL framed buildings really go up in a hurry—three stories per week in a typical apartment house.

Faster construction with steel means earlier completion, earlier rentals—extra income that would *never* be achieved with slower forms of construction.

Look at the *extra* bonus steel achieved on this 21-story, 700-room luxury apartment house in New York City.

Steel framing shortened the building time and speeded occupancy by two months.

The owner says this meant:

$112,000 in additional rental income.

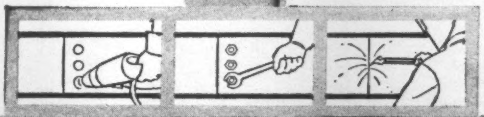
For that extra bonus . . . use **STEEL.**

American Institute of Steel Construction
101 Park Avenue, New York 17, N. Y.

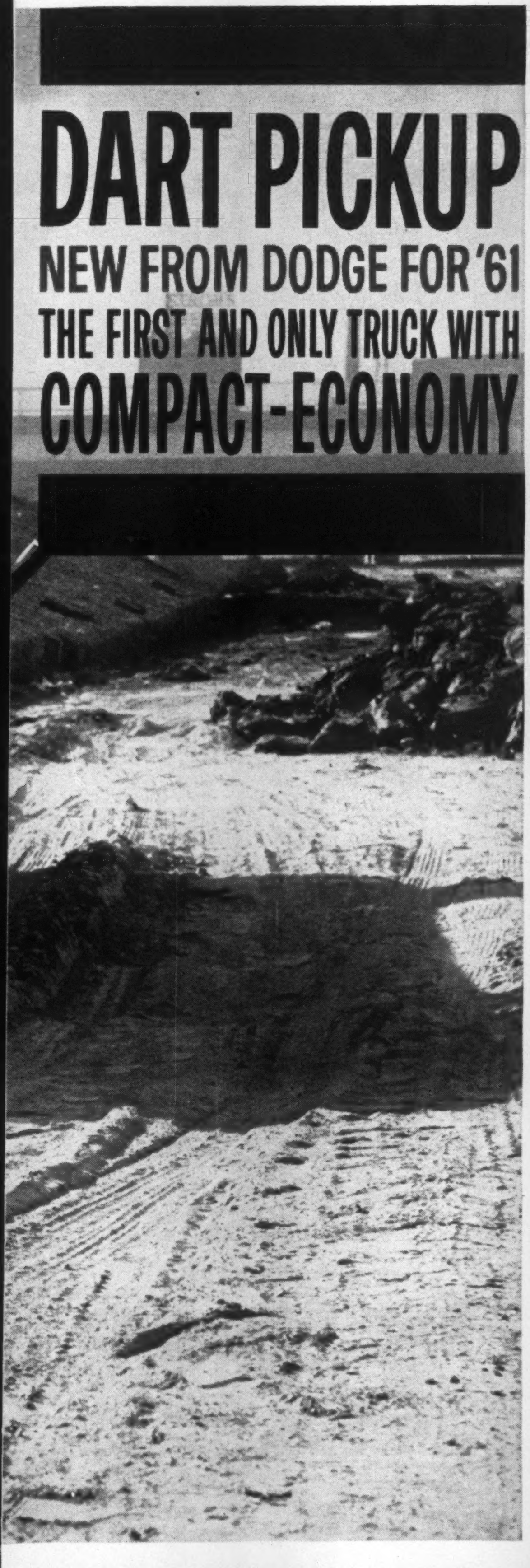
Owner-Builder — Senville Realty & Construction, Inc.
Architect — Schuman & Lichtenstein
Structural Engineer — Charles Mayer

Steel **STANDS** *for the future*

AISC



DODGE



DART PICKUP

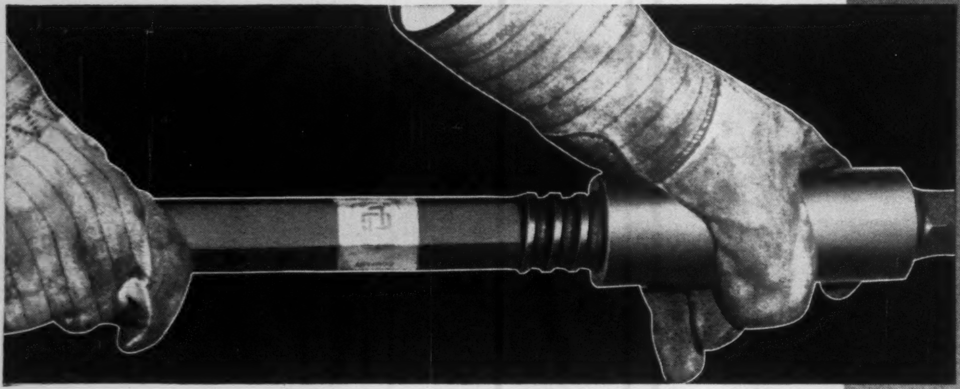
NEW FROM DODGE FOR '61
THE FIRST AND ONLY TRUCK WITH COMPACT-ECONOMY

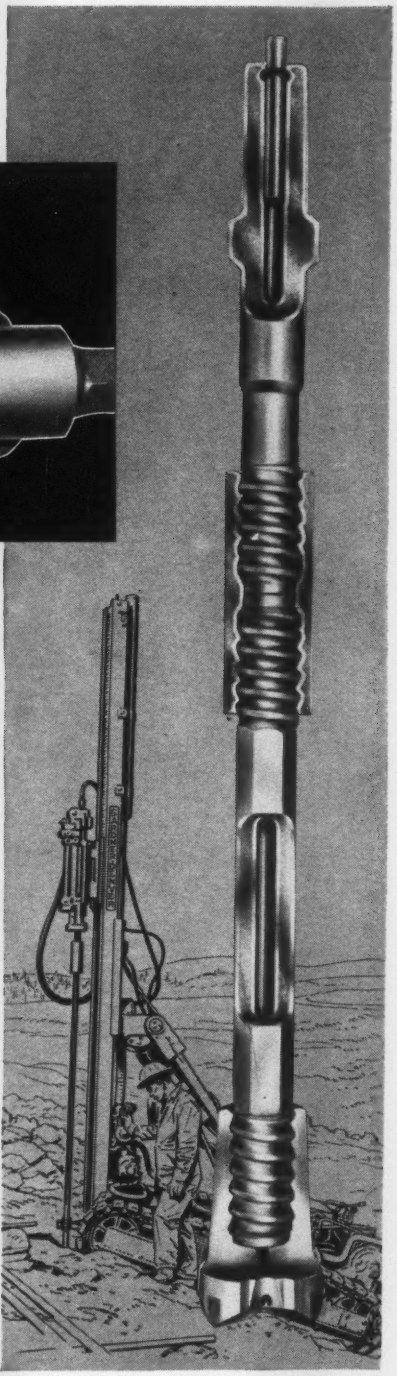
Compact diet. Compact upkeep costs. Compact in everything but work capacity. A full half-ton hauler that'll do the dirty jobs every day, day in and year out. New right down to the wheel studs. New cab. New body. New and easier clutching, shifting, handling. Even a new soft sound. New standard 140 hp. inclined engine that can deliver gas mileage competitive with anything in its field, and do it on regular gas. That's how our tests worked out. And we wouldn't talk about it if you couldn't get the same results. The engine is slanted 30 degrees from the vertical for top-notch manifolding, both intake and exhaust. **THE '61 DODGE LINE?** All Dodge, all tough from end to end. Conventional and cab forward models, four-wheel drive series, Town Wagons for toting men and tools. Six and V8 gasoline power. Cummins diesels. A weight spread of 4300 lbs. GVW to 76,800 lbs. GCW. **PRICE?** The new Dart Pickup and the whole 1961 Dodge line of trucks are priced to compete with every truck coming or going. What more do you want? See your Dodge dealer now!

DODGE TRADESMAN Puts your tools and supplies right where you want them. Vertical and horizontal compartments, with locks, on both sides. Big floor area for your bulky stuff. Offered with all-new Dart Power Six or V-8 power, 2- or 4-wheel drive.

A PRODUCT OF CHRYSLER CORPORATION

GARDNER-DENVER HI-LEED® STEEL





Prove it on your jobs —easiest to uncouple

On job after job, Gardner-Denver's HI-LEED sectional rod proves itself. It always uncouples readily. It saves time coming out of the hole. You can save time adding new steel in drilling hole. You profit by all these HI-LEED advantages:

Reduces steel breakage—less downtime due to losing steel and bit in hole. Fewer lost holes. Lowers cost of steel and bits.

Prevents lost holes—because HI-LEED design keeps mating parts snug; rods won't uncouple in the hole or while pulling out.

Sends more impact to the bit—because rod and coupling threads are in close contact over a large total area; rod ends are held firmly together.

Drills more footage per rod—because steel is carburized and shot-peened; wide-thread peak assures maximum wear.

These outstanding features of HI-LEED steel can help save your profits. Test HI-LEED steel on your drilling jobs. Want more details? Ask your Gardner-Denver Rock Drill Specialist, or send for Bulletin HLDS-1.

GARDNER-DENVER Since 1859

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois

Offices in principal U.S., Canadian and Mexican cities
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

International: Gardner-Denver International Division, 233 Broadway, New York 7, N.Y.
Offices: Buenos Aires, Argentina; Artarmon, N.S.W. Australia; Brussels, Belgium; Rio de Janeiro, Brazil; Santiago, Chile; Barranquilla, Colombia; Lima, Peru; Ndola, N. Rhodesia; Salisbury, S. Rhodesia; Johannesburg, Transvaal

Unit Prices

Wide range of concrete prices for . . .

Toronto Harbor Marine Terminal

Eighteen Canadian contractors bid on this $1 million marine terminal development job for the Toronto Harbour Commissioners; all bids were below the estimate. McNamara Construction Ltd., Toronto, was low at $1,188,042, 3% under Veramae Construction Ltd., Toronto, second low, and 19% below the high.

Unit prices were required only for evaluation of additions to, or deductions from, the "lump sum" bid; no quantities were involved in these prices. Concrete, for example, ranged from $18.60 to $35.00 a cu yd for concrete in slabs on fill, $40 to $100 in suspended slabs, $19.30 to $100 for dock walls, pile caps, and foundations, and from $24 to $162 a cu yd for precast concrete anchor blocks.

The development will include a 25 ft high, 210x660 ft, terminal building, service building, and guardhouse. The terminal building will have an area of 139,000 sq ft.

Planned for use by shipping berthed at either end of the building as well as at the main dock, the terminal will serve three or more ships, depending on size, at one time. The structure consists of countinuous openweb expanded girders spanning 60-90-60 feet, spaced at 30 ft centers and supported on steel columns. Foundations for the terminal building will be steel bearing piles 10x10 and 12x12 in.—55 to 60 ft long, with reinforced concrete pile caps and foundation walls. It will have 16 rolling steel doors 18 ft wide by 16 ft high on the west and east sides and four 20x20 ft rolling steel doors on the north and south sides. Natural light is admitted by means of glazed panels above the doors. The office section will have aluminum and porcelain enamel curtain wall. The general service building will be of steel frame and brick masonry construction, and the guardhouse steel construction with steel curtain walling.

Hourly wage rates, Toronto, include: common labor, building and heavy construction, $2.00/hr; bricklayers, $3.20; structural iron workers, $3.05; carpenters, $2.95; electrical workers, $3.52; and truck drivers, 1½ t, $2.05/hr.

The bidding included:

1C	McNamara Const. Ltd., Toronto, Canada	$1,188,042*
2	Veramae Const. Ltd., Toronto, Canada	1,225,300*
18	C. A. Pitts General Contr. Lts., Toronto, Canada	1,460,910*
EE	Toronto Harbour Comm., Engineering Dept.	1,500,000

Bids: 4-25-61 Items[1]	Unit	Quantity	Unit Prices 1 C	2
Orig lump sum price	ls	job	$1,200,000	$1,227,000

Special Items

Item	Unit	Quantity	1 C	2
Stone, crusher run, ⅝", compact to 3"	cy	4,700	$4.63	$4.00
Asph, crusher run, 1", compact to 2",[ab]	cy	3,400	0.70	0.75
Conc, crusher run, 3½", compact to 8"&9"[ab]	cy	25,000	0.70	0.75
Rubble, brick, compact to 6"&12"[ab]	cy	21,000	0.70	0.75
Asph conc, hot-laid 1, 1"		5,747	0.51	0.60
6, 2½"	cy	43,077	0.97	1.03
1, 1½"	cy	25,188	0.66	0.75
4, 3"	cy	46,012	1.13	1.21
Exc, filling, grading	cy	25,000	0.70	0.55

Unit Prices—Additions or Deductions

Item	Unit	Quantity	1 C	2
Conc, 3,000 psi, placed incl forms but not reinf steel,				
in slabs on fill	cy	......	18.60	24.00
in suspended slabs	cy	......	47.85	42.00
dock walls, pile caps, & fdn	cy	......	29.75	36.00
precast conc anch bl	cy	......	26.75	24.00
Steel, reinf	lb	......	0.12	0.13
str	lb	......	0.1185	0.125
Backfill, sand, supply & compact[b]	cy	......	2.00	2.85
Stone, crushed, grade & compact[b]	cy	......	4.63	4.50
Fill, sand or gran fill, Leslie St. stockpile[bc]	cy	......	1.25	1.10
Crushed mat, Leslie St. stockpile[bc]	cy	......	1.21	0.75
Asph conc, hot-laid 4, 2-layers, rdwy & areas, 3"				
sq yd	sy	......	1.27	1.21
ton	t	......	7.05	7.50
hot-laid 1, surf course, apron & load dock slab, 1"	sy	......	0.51	0.60
floor & apron, 1½"	sy	......	0.66	0.75
hot-laid 6, base course, floor & apron, 2½",				
sq yd	sy	......	0.97	1.03
ton	t	......	6.85	7.25
Piles, steel, f & drive, incl channel caps, BP10/42	lf	......	4.60	5.10
BP12/53	lf	......	5.65	6.25
Piles, splicing	ea	......	25.00	27.50
static, tests	ea	......	1,780	1,900
hammer, tests	ea	......	150.00	165.00
Upset, 2, ⅜", anchor rod, 3", w/turnbuckles, nuts, wash	lb	......	0.17	0.165
Tile, floor, vinyl asb, instl	sf	......	0.48	0.40
Armite, sprayed on, block	sf	......	0.36	0.38
plaster	sf	......	0.36	0.38
Pyrock, on met lath, ¾"	sf	......	....	0.52
Remove, obstr from exc & site weight over 1 ton	t	......	....	6.00
Holes, drill thru conc coping wall	ea	......	13.00	14.00
Weld, reinf to exist bars	ea	......	0.50	0.30
Steel, str, misc	lb	......	....	0.20
Alternative roof deck				
Conc, lightweight, in lieu of wood,				
A—deduct	ls	job	8,358	....
B—add	ls	job	....	10,000
Changes to roof & sheet met subcontr if conc, lightweight used for decking				
C—deduct	ls	job	1,700	1,700
D—add	ls	job	....	....
Alternative painting				
Subcontr,				
E—add	ls	job	950.00	4,100
Addenda				
F—over come wire obstacles per mile	ea	......	40.00	41.00
G—deduct, plaster ceiling in lieu sprayed	ls	......	1,900	....
H—plaster ceiling on met lath	ea	......	2.75	....
I—acoustical plaster ceiling on met lath	ea	......	3.00	....

*equals original lump sum price less alternatives A & C, and addendum G [1] supply & place unless otherwise noted a incl loading truck b place measure c loading, placing & compacting

BELLS

for all types of installations

Single stroke or vibrating

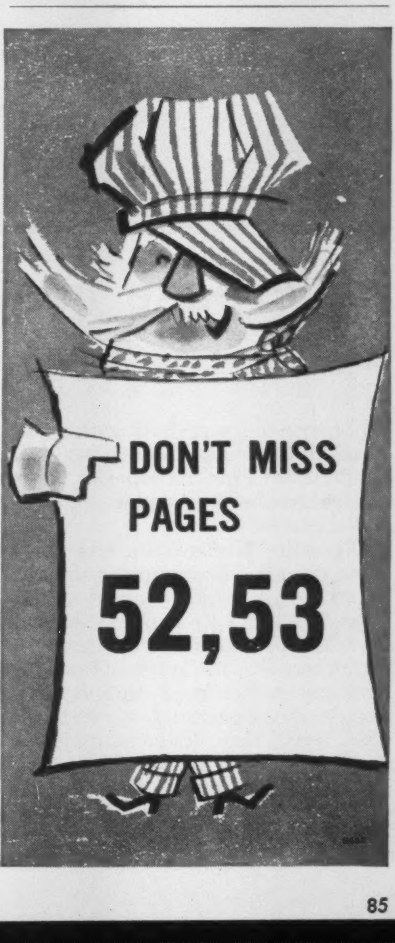
In all voltages—DC 6 to 220 v. AC 6 to 250 v.

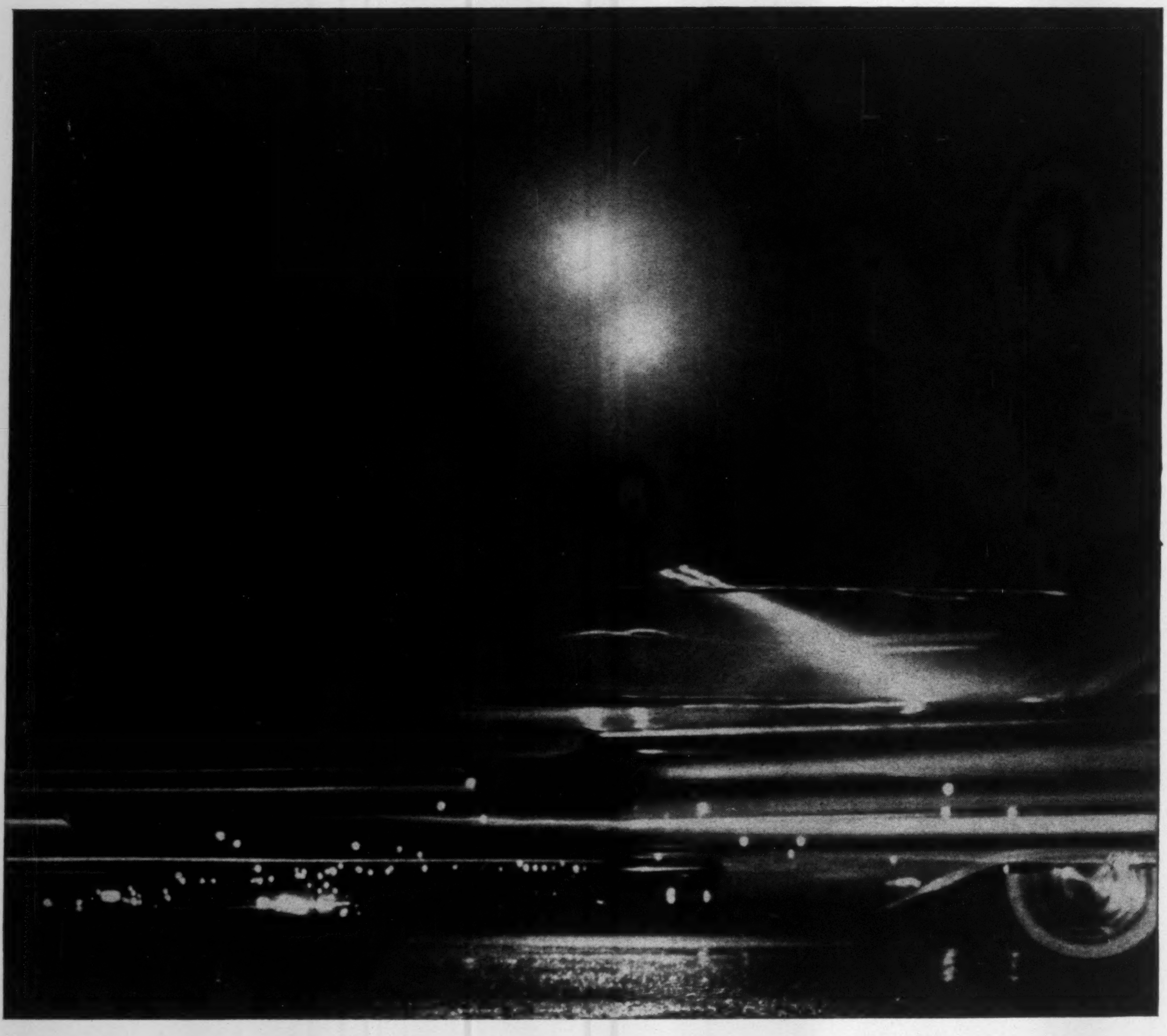
In sizes from 3" to 12"

For all telephone or alarm systems. Housings of sturdy cast aluminum with excellent clarity and high decibel output. Underwriters Laboratories listed. Also a full line of cow bells and buzzers.

Write for literature

HOSE-McCANN
TELEPHONE CO., INC.
25th St. & 3rd Ave., Brooklyn 32, N.Y.





Increase roadway and runway safety with Transite Underdrain Pipe

Johns-Manville
TRANSITE®
UNDERDRAIN
R-R70

Eliminate the contributing causes of sags, holes and similar hazards to under-wheel safety with perforated Transite® Underdrain Pipe. Its superior performance in groundwater control has been proved in many county, state and federal installations.

Transite Underdrain has an exceptional weight-to-strength ratio. The coupling, used to form the joints, assures a flexible yet reliably joined system. This, combined with long (10′ and 13′) lengths, keeps the pipe aligned and allows the line to ride with normal soil movement without disturbance to the system. Transite's smooth inner surface and low coefficient of friction assist the flow of water and reduce the opportunity for water-borne silt to build up on the invert. Thus, the accurately sized, drilled and located perforations can perform their function of letting groundwater into the line at a maximum flow rate.

For full details, send for data sheet TR-246. Write to Johns-Manville, Box 362, EN-8, New York 16, N. Y. In Canada: Port Credit, Ontario. Cable address: Johnmanvil.

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS

Materials Prices

Monthly Market Quotations By ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, July 20; Next, Aug. 24.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, July 27; Next, Aug. 31.
- Wage Rates, Building Board, Lath, Insulation: Last, Aug. 3; Next, Aug. 31.
- Cement Aggregate, Ready Mixed Concrete Asphalt: Last, Aug. 10; Next, Sept. 7.

Iron and Steel Products—F. O. B. Warehouse, Per 100 lbs., Base Price

Item	Unit	Atlanta W	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles##	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St Louis	San Francisco	Seattle	Montreal	Toronto
Struct. shapes	Cwt	$7.52–8.15sV	$9.70	$9.00ty	$8.00–9.30KzsV	$7.07–8.34ysV	$7.64–8.91styV	$7.46–8.73tysV	$7.51–9.18MsV	$8.24cK	$7.64–8.91MsV	$9.90sT	$8.70–10.45ktsV	$7.78–8.17ysV	......	$7.85-9.13Vzs	$7.35–8.40zsV	$7.07–8.34syV	$7.30–8.57stxyV	$9.40–11.25zsV	$8.60–10.80aDsV	$7.90-8.60CF/8.20-8.90AiF	$9.20H
Reinf. bars, new steel	"	7.57	9.00T	6.81syV	8.75t	6.50–6.65guV	8.21t#	6.70ct	8.50	9.35	7.37	8.21N	7.35frt	9.26T	$8.00gktz	8.60ty	7.93uy	7.35y	7.35#txQ	8.25jS	9.00DM	7.00/7.50FGi	7.60
Reinf. bars, rail steel	"	......	......	6.81syV	8.75t	6.50–6.65guV	......	......	8.50	......	11.85	......	......	9.26T	......	8.60y	9.30y	......	7.35#txyQ	......	......	7.00/7.50FGi	7.60
Expanded metal lath k std. diamond mesh, 3.4 lb	"	43.50	44.50	61.00pK	47.00K	52.00#U	44.50Kg	42.50KL	44.50u	51.17n	67.00 O	51.00	55.00S	44.50K	64.50K	50.00n	45.50#U	58.50#rw	64.00wxK	53.00S	67.00#nD	65.700h	49.50qI
std. ribbed, 3.4 lb	"	48.00S	49.00	67.00pK	51.00K	63.00#U	48.50mnKg	46.50KL	49.00w	56.35n	74.00 O	55.56	64.00S	49.00K	61.00K	58.00no	50.00#U	64.50#rw	65.00wxK	58.00S	73.50#nD	70.20h	44.85qI

Reinforcing Bar Extras, per cwt, N. Y.—• Quantity (applies to LCL shipments only): under 1,000#, +$1.80; 1000–1999# +$1.50; 2000–4999#, +$1.20; 5000–9999#, +90¢; 10,000–19,999#, +60¢; 20,000–29,999#, +30¢; 30,000–39,999#, +10¢; 40,000# & up, none. • Size†: #2 +$2.50; #3 +$1.40; #4 +$1.00; #5 +70¢; #7, #8, #9, #10, #11 +50¢ • Bending: heavy, +90¢; light +$2.20 (except in New York City and surrounding metropolitan area where bending must be done on the job). • Engineering (details and placing from designs by others); over 500 tons, +45¢; 200–499 tons, +50¢ but not over $4500; 75–199 tons, +65¢ but not over $2000; 20–74 tons, +75¢ but not over $975; 5–19 tons, +85¢ but not over $300: under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60¢.

Structural Shape Extras, per cwt, Chicago, Cincinnati, Cleveland, Dallas, Detroit, New York, Philadelphia, St. Louis and Pittsburgh. Item; 10,000# and over, base, 5,000–9,999#, +10¢, 2,000–4,999#, +35¢, 1,000–1,999#, +85¢, 400–999#, +$1.75, 100–399#, +$1.75, under 100#, +$1.75. Order: 20,000# and over, base, 10,000–19,999, +25¢, 5,000–9,999, +65¢ 2,000–4,999, +$1.50, 1,000–1,999, +$2.50, 400–999, +$4.00, under 400, +$8.00. Item extras do not apply in Chicago, Cleveland, Cincinnati, Detroit and St. Louis.

•# Delivered. •* Aver. of Canadian & American. •## add 4% sales tax. •a 2000–4999#. •b 10,000–19,999#, fob city. •c 20 tons or over. •d 10,000–29,999#. •e Intermediate struct'l. •f incl. delivery in free zone. •g CL. •h list price; dominion tax exempt; add provincial and municipal taxes. •i add provincial and municipal sales taxes. •j intermediate and hard grade. •k fob city. •l delivered; contractor to do unloading. •m copper alloy. •n LCL. •o asphalt coated. •p 500 sq yd. or more. •q 2.5 lb. •r less 2% disc. for cash. •s 10,000# item in 20,000# order. •t less ½% disc. 10 days. •u add 10¢ switch. •v incl 15¢ del. •w truck lots. •x add 2% sales tax. •y add 15¢ del. •z add 10¢ del. •A American made. •C Canadian made. •D ½% for cash. •E 30,000# or over. •F Federal tax exempt for bldgs. •G add 10¢ del. •H $8.85 without tariff charges. •I 3 lb $60.00. •J 4 lb $47.50. •K less 2% disc. 10 days. •L F.o.b. Youngstown plant. •M 5,900–9,999#. •N 2,000–19,999#. •O 100 sy lots. •Q 5 tons to CL. •R revised. •S less 2% disc. 10th. •T less ½% disc 10th of mo. •U less 2% disc. 10 days. •V varies according to type and size. •W add 3% sales tax

Iron and Steel Products—Base Mill Prices Carlot Quantities

Item	Unit	Birmingham area	Chicago area	Pittsburgh	Buffalo area	Cleveland	Youngstown area	Geneva	Los Angeles	Pueblo
Struct. Shapes	cwt	$5.50	$5.50	$5.50	$5.50	......	......	$5.50	$6.20	......
Plate Carbon Steel	"	5.30	5.30	5.30	5.30	......	......	5.30	......	......
Reinf. Bars (billet)*	"	5.675	5.675	5.675	5.675	$5.675	$5.675	......	6.375	......
Rivets, ½" struct	"	12.25	12.25	12.25	12.25	12.25	......	......	......	......
Sheet Piling (base)	"	......	6.50	6.50	6.50	6.50	......	......	6.50	......
Steel Rails, standard	Ton	110.50	110.50	110.50	110.50	......	......	......	......	......
light	"	130.00	130.00	130.00	130.00	......	......	......	......	......
Track Supplies										
Angle bars	cwt	6.975	6.975	6.975	6.975	......	......	......	......	$6.975
Std. spikes	"	9.75	9.75	9.75	9.75	......	9.75	......	9.75	9.75
Tie plates	"	6.60	6.60	6.60	6.60	......	......	......	6.875	6.60
Track bolts	"	......	......	14.75	14.75	14.75	......	......	......	......

* Fairless Works, $5.825 Revised. These prices are nominal. Major reinforcing bar producers now quote prices on the basis of individual inquiries.

*WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote

Mill	2½ & 3 in.*		3½ to 6 in.*	
	Black %	Galv. %	Black %	Galv. %
Lorain, Ohio	13.75	+3.50	+1.75f	+19.50f
Aliquippa, Pa.	13.75	+3.50	3.25a	+14.50a
Sparrows Pt., Md.	17.25	+List	......	......
Benwood, W. Va.	13.75	+3.50	......	......
Youngstown, O.	13.75	+3.50	3.25	+14.50a
Indiana Harbor, Ind.	12.75	+4.50	2.25ab	+15.50a
Sharon, Pa.	13.75	+2.50	3.25ab	+13.50ab
Wheatland, Pa.	13.75	+3.50	3.25a	+14.50a
Etna, Pa.	13.75	+3.50	.50de	......
Fontana, Calif.	0.75	+16.50b	+9.75ab	+27.50ab

* Threaded and coupled: a 3½ to 4 in. b to 1, 5 and 6 in. c 6 in. d Seamless 5 in.

WROUGHT STEEL PIPE, butt or continuous weld: Deduct (+) or add (−) these "discounts" from or to the following carlot list prices to get mill prices. Price per ft. (based on approx. $200 per net ton): 2½ in., 58½¢; 3 in., 78½¢; 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight for destination price.

WROUGHT IRON PIPE, lap weld: List prices per ft. same as for wrought steel pipe, but add these "discounts" to get Pittsburgh mill price. 2½ to 3 in., black 106%; galv. 139%; 4 to 6 in., black 103%; galv. 133%. Add freight for destination price.

WELDED FABRIC REINFORCING, FOB Joliet, Ill., Donora, Pa., Monessen, Pa. mill, per 100 sq. ft.: 4 x 18 in., No. 5 & 10 wires....$7.04; 4 x 12 in., No. 8 & 12 wires....$2.62; 6 x 8 in., No. 6 & 6 wires....$4.17

Plumbing, Heating, Water, Sewer Pipe and Tubing

Item	Unit	Atlanta W	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit
C. I. Pipe Price Index	a	130.6	140.2	125.8	143.2	140.0	135.6	141.8	137.9	145.1	142.1
Asbest. Cem. Pipe, 6"	lin. ft.	$1.51	$1.51	$1.51	$1.51	$1.51	$1.63	$1.63	$1.59	$1.59	$1.51
6" transite pipe	" "	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.59	1.51
Asbest. Cem. Pipe, 12"	" "	2.36	2.19	2.26	2.19	2.19	2.19	2.19	2.26	2.36	2.19
12" transite pipe	" "	2.48	2.30	2.37	2.30	2.30	2.30	2.30	2.37	2.48	2.30
Clay Sewer Pipe											
8 in. ASTMC 13-55	ft.#	0.546rn	0.665	0.50r	0.84qrtL	0.93rm	0.595	0.66BCN	0.575#B	0.56nr	0.97nk
12 in. " "	"	1.04rn	1.20	0.95r	1.55qrtL	1.78rm	1.15	1.27tBC	1.09#B	1.00nr	1.86nk
24 in. ASTMC 200-55T	"	4.49rn	3.05	4.14rw	6.39qrtM	7.52rm	4.95	8.47tBC	4.75#B	4.98r	7.48nk
36 in. " "	"	......	12.71	13.50rw	......	21.16rm	14.35	23.45tBC	10.53#bB	......	19.95nk
Clay Drain Tile 6 in. V	M ft.	200.00sr	187.80	295.00rx	244.00r	220.00Br	177.50	179.40mBC	......	460.00nr	212.00mk
8 in. V	M ft.	......	289.20	430.00rx	348.60r	330.00Br	274.60	276.60mBC	......	640.00nr	327.00mk
Concrete Sewer Pipe, 12"	ft.#	0.95mKr	1.01	1.75rS	1.56S	1.30	0.85rA	1.35	1.27BD	1.05m	1.40k
21 in.	ft.#	3.75mKr	2.75	2.75rS	3.60S	4.00	3.25rA	2.40P	2.95BD	3.50m	5.23k
Copper Water Tubing											
3/8", Type L	ft.	0.1480	......	0.1650	0.1420	0.1420	0.1420	0.1420	......	0.1680	0.1588
1/2", Type L	"	0.1670	......	0.1840	0.1630	0.1630	0.1630	0.1630	......	0.1900	0.2210

Item	Unit	Kansas City	Los Angeles##	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montrea	Toronto
C. I. Pipe Price Index	a	138.6	148.6	145.0	132.4	138.6	137.9	142.9	135.7	148.6	149.0	......	......
Asbest. Cem. Pipe, 6"	lin. ft.	$1.51	$1.59	$1.51	$1.51	$1.51	$1.51	$1.51	$1.48	$1.59	$1.59	......	......
6" transite pipe	" "	1.51	1.59	1.51	1.51	1.51	1.51	1.51	1.51	1.59	1.51	......	......
Asbest. Cem. Pipe, 12"	" "	2.26	2.19	2.26	2.26	2.19	2.19	2.19	2.26	2.19	2.19	......	......
12" transite pipe	" "	2.37	2.30	2.37	2.37	2.30	2.30	2.30	2.37	2.30	2.30	......	......
Clay Sewer Pipe													
8 in. ASTMC 13-55	ft.#	0.62r	0.86bl	1.05oB	0.566r	0.94	0.75	0.94K	0.62r	0.86#d	0.91bk	1.13u	0.76F
12 in. " "	"	1.125r	1.86blS	1.90oB	1.078r	1.76	1.44#	2.01K	1.23r	1.86#d	1.94kb	2.00u	1.43F
24 in. ASTMC 200-55T	"	6.324br	7.55blS	8.00oB	5.65r	12.89	9.49#v	8.79K	5.10r	7.53#d	7.78x	7.00u	5.70F
36 in. " "	"	16.86r	16.39blS	......	......	35.61	25.73#v	24.15K	12.95rS	18.00#d	......	13.50u	......
Clay Drain Tile 6 in. V	M ft.	315.00r	410.00lS	......	240.50pr	240.81	225.00#	190.00	180.00r	360.00#l	260.00ck	288.00	175.00F
8 in. V	M ft.	625.00r	590.00lS	......	566.00	369.84	345.00#	295.00	300.00r	620.00#l	135.00	545.00	290.00F
Concrete Sewer Pipe, 12"	ft.#	1.68r	1.30vE	2.19DFH	1.50ilR	1.50#B	2.00#h	1.66DB	1.75i	105.00#Q	1.90ky	1.17D	1.27r
21 in.	ft.#	4.20r	3.85fvE	6.31DFH	4.15il	3.60#B	4.30#h	3.93DB	4.05	3.30#Q	4.50ky	3.11jpD	5.19F
Copper Water Tubing													
3/8", Type L	ft.	0.1320	0.1620	0.1620	0.1680	0.1491	0.1620	0.1441	0.1420	0.1480	0.1450	0.2089U	0.3344UV
1/2", Type L	"	0.1480	0.1840	0.1840	0.1900	0.1712	0.1840	0.1900	0.1630	0.1670	0.1640	0.2450U	0.3485UV

•† Extra quality. •# delivered. •## + 4% sales tax. •a **PRICE INDEXES or CENTRIFUGAL CAST IRON PIPE** (Include carload freight allowed to city). These also serve as the **HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S. PIT CAST IRON PIPE.** F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. For explanation of index see ENR Sept. 29, 1955 page 139. •b Extra strength. •c 4-in., $130. •d SS361-A. •f 21 in. •g culvert pipe; reinf., ASTM C 75-56. •h reinf., ASTM C 75-54. •i reinf., ASTM C 76-55. •j centrispun. •k less 2% disc. for cash. •l fob plant. •m truck del. •n LCL del., fob truck. •p less 5% disc. 10th. •p freight allowed to destination in city. •u 35,000# minimum. •r less 2% disc. 10 days. •s 1 ft lengths. •u CSA A 60. •v standard strength. •w SS; add 20% for d.s. •x fob city. •y Reinforced. •z Upper value in range based on both truck lots and less than truck lots, fob city; lower value truck lots delivered. •A single strength. •B truckload. •C less 2% disc. 15th. •D ASTM 76-57. •E less 1% disc. 10 days. •F less 2% disc. 30 days. •G LCL. •H CL. •I fob origin, freight allowed. •J reinf. B14-15. •K Less 2% disc. 15 days. •L ASTM 13-57. •M ASTM 200-57. •N 2 ft lengths. Trucklots. •O add 2% Sales Tax. •P 18 in. •Q less 1% disc. 10th. •R revised. •S ASTMC 72, 12" 1.55, 24" 4.00. •T Second price transite pipe. •U Type K. •V including 11% sales tax, less 20% in lots under 6,000 ft. •W add 3% sales tax

Construction Reports

Bid Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

BUILDINGS—BA

▲ **Mass., Woburn**—BA 9/5—City, Supt. P. Wks., City Hall, SENIOR HIGH SCHOOL ADDN. $3,500,000. Plans deposit $100. Edward J. Tedesco, 15 Pleasant St., archt. Souza & True, 102 Mt. Auburn St., Cambridge, struct. engrs. CD 4/27/61.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth Mass., Dpt. P. Wks., 100 Nashua St., Boston, ROAD,

The Barletta Co., 10 Whipple Ave., Roslindale, Mass., CA **$2,139,853**, est. $2,431,697, section Int. Rte. 290, Proj. 1-290-5(8)98, Worcester. BA 6/20. CD 6/22/61, under LB.

BUILDINGS—LB & CA

▲ **Rocheford Constr. Co.**, 227 W. Central St., Natick, Mass., CA **$1,348,000**, HIGH SCHOOL, west side of Oak St., FRANKLIN, MASS. Town, Supt. Schools, High School, West Central St., Franklin, Mass. BA 7/18. CD 7/21/61, under LB.

▲ **Joseph Rugo, Inc.**, 115 Homes Ave., Dorchester, Mass., CA **$5,434,000**, Phase 1, Mass 35-1, HOUSING, Riverside Rd., SPRINGFIELD, MASS. City Housing Auth., Robert Dyer Circle, Springfield, Mass. BA 6/29. CD 7/6/61, under LB.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **Del., Smyrna**—BA 8/24—Delaware State Welfare Home, 2 story WELFARE HOME ADDN. $1,500,000. Plans deposit $50. Whiteside, Moeckel & Carbonel, 9tn and Market Sts., Phila., Pa., archts. L. H. Doane & Assocs., Front and Frence Sts., Wilmington, engrs. CD 6/5/61.

▲ **N. J., Sewell**—BA 8/29—Washington Twp. Bd. Educ., Sewell, JUNIOR-SENIOR HIGH SCHOOL. $1,250,000. Micklewright & Mountford, 90 E. Stuyvesant Ave., Trenton, archts.

▲ **Del., Newark**—BA 8/30—Newark Bd. Educ., Newark, Christiana HIGH SCHOOL. $4,000,000. Plans deposit $75. Martin & Wason, 830 West St., Wilmington, archts. Chester I. Duncan, 225 S. 15th St., Phila., Pa., engr. CD 2/20/61

▲ **N. Y., Brooklyn**—BA 9/5—Deputy Supt. Schools, Bureau Constr., 42-15 Crescent St., 4th Floor, Long Island City, Zone 1, general constr., plumbing and drainage, heating and ventilating and electrical work and lighting fixtures PUBLIC SCHOOL 309, Ralph, Madison and Monroe Sts., Spec. Nos. 204, 205, 206 and 207 of 1960, Brooklyn Boro. $2,200,000. Plans deposit $25 general constr., $10 each mechanical trades. CD 3/14/61.

▲ **Pa., Phila.**—BA 9/12—American Federation of Labor Medical Service Plan Hospital, 253 N. Broad St., HOSPITAL, Langdon and Sanger Sts. $4,000,000. Ellerbee & Co., 333 Sibley St., St. Paul, Minn., archts. McCormick, Taylor & Assocs., 1617 Penna Bldg., engrs. CD 5/13/60.

▲† **Pa., Phila.**—BA 9/8—Dist. Pub. Wks. Office, 4th Naval Base, 400 units CAPEHART HOUSING, 20th and Paterson Sts., Naval Base, NBy-CH 30891. $6,400,000. Extended date. Bellante & Clauss, Suburban Station Bldg., archts. CD 7/20/61.

BUILDINGS—SLC

▲ **Md., Emmitsburg**—Mount St. Mary's College, soon lets contract 3 story, bsmnt. T-shaped 42,200 sq. ft. DORMITORY, 1 story, partial 2 story, 43,860 sq. ft. T-shaped STUDENT UNION structural steel, brick, concrete block CH MD-25-DS. $1,500,000. May & Ruppert, 1308 18 St., N.W., Wash., D. C., archts.

HEAVY CONSTRUCTION—LB & CA

▲† **Acme Missiles & Constr. Corp.**, 43 N. Village Ave., Rockville Centre, N. Y., CA **$2,224,617**, AIR ROUTE TRAFFIC CONTROL CENTER BLDG., MacArthur Field, ISLIP, N. Y. Federal Aviation Agency, New York International Airport, Jamaica, N. Y. BA 7/11. CD 7/13/61, under LB.

▲ **Inland Bldg. Systems, Inc.**, 52 A Main St., East Orange, N. J., LB **$2,134,804**, (4 bidders), Contract EP-110.010, Elizabeth-Port Authority Piers, BLDG. 121, 122, 125 and 126, ELIZABETH, N. J. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. BA 8/3/61. CD 7/25/61.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, ROADS,

S. J. Grove & Sons Co., P.O. Box 355, Camp Hill, Pa., CA **$3,997,759**, 16,874 ft. c. conc. pavement 26 ft. wide and 8 bridges, L. R. 1000(F-3C) sect. of Delaware Expressway (Interstate), Bucks Co. BA 7/20/61. CD 7/25/61, under LB.

BUILDINGS—LB & CA

▲ **D. Fortunato, Inc.**, 11 Garfield Ave., Floral Park, N. Y., LB **$3,057,000**, JUNIOR-SENIOR HIGH SCHOOL, LOCUST VALLEY, N. Y. Bd. Educ. Central School Dist. No. 8, Horse Hollow Rd., Locust Valley, N. Y. BA 8/3. CD 7/17/61.

▲ **Yonkers Structural Corp.**, 215 E. 204 St., New York 58, N. Y., Owner Builds, **$2,500,000**, 6 story APARTMENT, Central Ave. north of Tuckahoe Rd., NEW YORK, N. Y. Herbert & Clarence Lilien, 1841 Broadway, New York 23, N. Y., archts.

▲ **J. D. Constr. Co.**, 50 Piermont Rd., Cresskill, N. J., CA **$1,363,000**, general contract HIGH SCHOOL, CRESSKILL, N. J. Bd. Educ. Borough of Cresskill, Dogwood Lane, Cresskill, N. J. BA 7/28/61. CD 8/2/61, under LB.

▲ **Irwin & Leighton Inc.**, 1505 Race St., Philadelphia, Pa. CA **$6,017,000**, 2 story, 240,000 sq. ft. air conditioned OFFICE, HIGHTSTOWN, N. J. McGraw-Hill Publishing Co., Inc. 330 W. 42 St., New York 36, N. Y. (**Correction**-cost) BA 7/26/61, CD 8/3/61, under CA.

▲ **Thomas Constr. Co.**, Haledon Ave., Paterson, N. J., LB **$1,407,900**, ELEMENTARY SCHOOL 28, PATERSON, N. J. Bd. Educ. City of Paterson, 137 Ellison St., Paterson, N. J. BA 8/3/61. CD 6/27/61.

▲ **Carcaise Constr. Co.**, P.O. Box 29, Rochester, Pa., CA **$2,062,224**, HIGH SCHOOL, for Hopewell-Independence, Raccoon Jt. School Bd., ALIQUIPPA, PA. Pa. Pub. School Bldg. Authority, 101 S. 25th St., Harrisburg, Pa. BA 7/6/61. CD 7/11/61, under LB.

▲ **Baltimore Contractors, Inc.**, 711 S. Central Ave., Baltimore, Md., CA **$7,403,000**, CIVIC CENTER, BALTIMORE, MD. City, City Hall, Baltimore, Md. BA 7/26 (**Correction**-contractors' name). CD 8/4/61, under CA.

▲ **Merrimack Constr. Corp.**, 4916 Del Ray Ave., Bethesda, Md., Owner Builds, **$2,240,000** (Section 2), 280 unit Congressional Airport APARTMENT, ROCKVILLE, MD. Cohen Haft & Assoc., 7961 Eastern Ave., Silver Spring, Md., archts. CD 3/30/61.

SOUTH

HEAVY CONSTRUCTION—BA

▲ **Tenn., Nashville**—BA 9/19—City, City Hall, Office of the Purchasing Agent, Proj. No. 11, WATER TREATMENT PLANT IMPRVS., general constr. Plans deposit $100. Chester Engineers, 601 Suismon St., Pittsburgh 1, Pa. CD 2/24/59.

HEAVY CONSTRUCTION—LB & CA

▲ **American Bridge**, Div. U. S. Steel Corp., 1375 Peachtree St., Atlanta, Ga., LB **$1,607,000**, Base Bid, STRUCTURAL STEEL JET OVERHAUL FACILITIES, Miami International Airport, MIAMI, FLA. Dade County Port Authority, 10th Floor Courthouse, Miami, Fla. Eastern Air Lines, lessee. BA 8/1/61. CD 7/17/61.

▲ **LOUISIANA**—Ascension St. James Bridge & Ferry Auth., Hotel Donaldson, 508 Mississippi St., Donaldsonville, La., BRIDGE,

American Bridge Div. United States Steel Corp., 655 M & M Bldg., Houston, Tex., CA **$12,900,000** superstructure Sunshine Toll Bridge across Mississippi River at Donaldsonville. BA 7/17, CA 8/2. CD 7/11/61, under LB.

▲ **W. L. Harper Co.**, 2910 Highland Ave., Norwood, O., CA **$2,155,100**, WATER TREATMENT PLANT, NEWPORT, KY. City, 4th and York Sts., Newport, Ky. BA 7/25, CA 8/2. CD 8/2/61, under LB.

BUILDINGS—LB & CA

▲ **Farrel-Birmingham Co., Inc.**, 148 Main St., Ansonia, Conn., CA Est. **$11,000,000** with equipment, SUGAR MILL, BELLE GLADE, FLA. Sugar Cane Growers Cooperative, Belle Glade, Fla.

▲ **Robert L. Turchin, Inc.**, 1835 Purdy Ave., Miami Beach, Fla., CA Est. **$6,000,000**, 10 story, 400,000 sq. ft. King Cole APARTMENTS, swimming pool, parking garage, boat docks, on Bay Dr., MIAMI BEACH, FLA. Robert Rautboard and Robert Blum, 203 N. Wabash Ave., Chicago, Ill. CD 8/2/61, under King Cole Apartments Corp., as owner.

▲ **Frank J. Rooney, Inc.**, 5880 NE 4th Ave., Miami, Fla., CA Approx. **$4,000,000**, APARTMENTS, Carlton Towers, 5th Ave. S. and 3rd St., ST. PETERSBURG, FLA. Nationwide Development Corp., 1025 Kane Concourse, Bay Harbor (Miami Beach) Fla. Wiener & Dutkin, 1400 NE 123 St., Miami, Fla., archts. CD 1/26/60.

▲ **R. M. Thompson Constr. Co.**, 712 Grand Central Ave., Clearwater, Fla., CA Est. **$2,000,000**, 180,000 sq. ft. SHOPPING CENTER, 4th St. N. between 83rd Ave. and 77th Ave. N., ST. PETERSBURG, FLA. Petwinstan, Inc., c/o Frank Mudano, archt., 16 S. Fort Harrison, Clearwater, Fla.

▲ **Perrilliat-Rickey Constr. Co.**, Box 13128, New Orleans, La., CA **$1,676,885**, 2 story brick HIGH SCHOOL and Sister's RESIDENCE, 1 story, brick AUDITORIUM-GYMNASIUM-CAFETERIA BLDG., NEW ORLEANS, LA. New Orleans Female Dominican Academy, 7214 St. Charles Ave., New Orleans, La. BA 6/20. CD 7/6/61, under LB.

MIDDLE WEST

BUILDINGS—BA

▲ **Wis., Madison**—BA 8/25—Hilldale, Inc., c/o Schuster & Co., 2153 North 3rd St., Milwaukee, 1 and 2 story, 230,000 sq. ft. SHOPPING CENTER, incl. 3,000 car parking. $2,000,000. Grassold-Johnson & Assocs., 734 N. Jefferson St., Milwaukee, Zone 2, archts. CD 6/4/59.

HEAVY CONSTRUCTION—LB & CA

▲ **Gust K. Newberg Constr. Co.**, 2040 N. Ashland St., Chicago, Ill., CA **$4,983,192**, PARKING LOT, RB 44, O'Hare Airport, Proj. 80.85-61-141, Park Ridge, CHICAGO, ILL. City, City Hall, Chicago, Ill. BA 7/20/61. CD 7/25/61, under LB.

▲ **WISCONSIN**—State Hy. Comn., Room 535, State Office Bldg., Madison, Bids opened 8/1, ROADS,

Wis.—**Harrison Engineering & Constr. Corp.**, 3706 Broadway, Kansas City, Mo., LB **$423,612**, grade, base, concrete pavement 1.58 mi. I.H. 90 and STH 26, Madison-Janesville Rd. (STH 26-USH 14) and USH 14 No. County Line Rd., Contr. 1, I-90-3(66)170 and F 010-1(27), Rock Co.;

Wis.—**James Cape & Sons Co.**, 701 Water St., Racine, Wis., LB **$1,872,218**, grade, base, structure, retaining walls and conc. pavt. 1.67 mi. North-South Expressway (W. Keefe Ave.-W. Lexington Blvd.), Contr. 1, U 077-1(24), Milwaukee Co.;

Wis.—**Bacco Constr. Co.**, N.U.S. 2, Iron Mountain, Mich., LB **$415,260**, grade, subbase and base 1.717 mi. USH's 2 and 51, Hurley Interchange and approaches and Hurley-USH 2 Rd., Contr. 1, F-22-1(40) and and F 05-4(46), Iron Co. CD 7/6/61.

▲ **R. L. Coolsaet Constr. Co.**, 7600 Middlesex Ave., Dearborn, Mich., CA Est. **$2,000,000**, 36 in. steel GAS TRANSMISSION LINE, Van Born Rd., Willow Run to Rouge River Station, Melvindale-Taylor, Wayne Co., MICHIGAN. Michigan Consolidated Gas Co., 416 Clifford St., Detroit 26, Mich. CA 7/24. CD 2/21/61.

BUILDINGS—LB & CA

▲ **Grant-Holliday Constr. Corp.**, Commercial Bldg., Dayton, O., Owner Builds, **$5,250,000**, 350 HOMES, Boron Farms, Perry Twp., CANTON, O.

▲ **Frank Messer & Sons, Inc.**, Paddock Rd., Cincinnati, O., CA **$7,303,300**, brick, stone OFFICE Waycross and Mill Rd., CINCINNATI, O. Union Central Life Insurance Co., 5 W. 4th St., Cincinnati, O. BA 6/20/61, CA 8/2/61. CD 6/30/61, under LB.

▲ **Coath & Goss**, 5103 Lake Chicago St., Chicago, Ill., CA **$2,118,139**, Proj. 80.75-61-36, CENTRAL POLICE HEADQUARTERS, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. BA 7/14/61. CD 7/20/61, under LB.

▲ **Edward J. DeBartolo Co.**, 7620 Market, Youngstown, O., CA Est. **$6,000,000**, 350,000 sq. ft. SHOPPING CENTER, 2,500 car-parking, Gratiot Ave. and 15-Mile Rd., Clinton Twp., MOUNT CLEMENS, MICH. Regional Shopping Center, c/o Kenneth Sanborn, Agent, 131 Mt. Clemens St., Mount Clemens, Mich. CA 8/1. CD 4/21/61.

▲ **Sorenson-Gross Constr. Co.**, 2505 Lapeer, Flint, Mich., CA **$1,978,078**, general contr. HIGH SCHOOL and SWIMMING POOL, OWOSSO, MICH. Owosso P. Schools, 224 John St., Owosso, Mich. BA 6/22. CD 7/6/61, under LB.

MISSISSIPPI TO ROCKIES

BUILDINGS—BA

▲ **Colo., Fort Collins**—BA 8/24—Colorado State University, Campus, (State Planning Commission, State Capitol, Denver), 1 and 2 story Women's DORMITORY. $2,000,000. James M. Hunter, 1126 Spruce St., Boulder, archt. CD 2/28/57.

▲ **Tex., Galveston**—BA 9/6—First Methodist Church, 1902 Sealy St., EDUCATIONAL WING, CHAPEL, SANCTUARY, $1,600,000. Plans deposit $50. Mark Lemmon, 3211 Southland Center, Dallas, archt. Zumwalt & Vinther, Merc. Dallas Bldg., and R. L. Rolfe, 2401-A Bryan St., Dallas, engrs. CD 11/23/60.

▲ **Tex., Arlington**—BA 11/1—Texas A & M College System, College Station, 4 story, 100,000 sq. ft., rein.-con., etc., SCIENCE BLDG. ADDN., Arlington State College. $2,000,000. Plans deposit $50. Preston M. Geren, 1607 Fort Worth Natl. Bldg., Fort Worth, archt. CD 11/15/60.

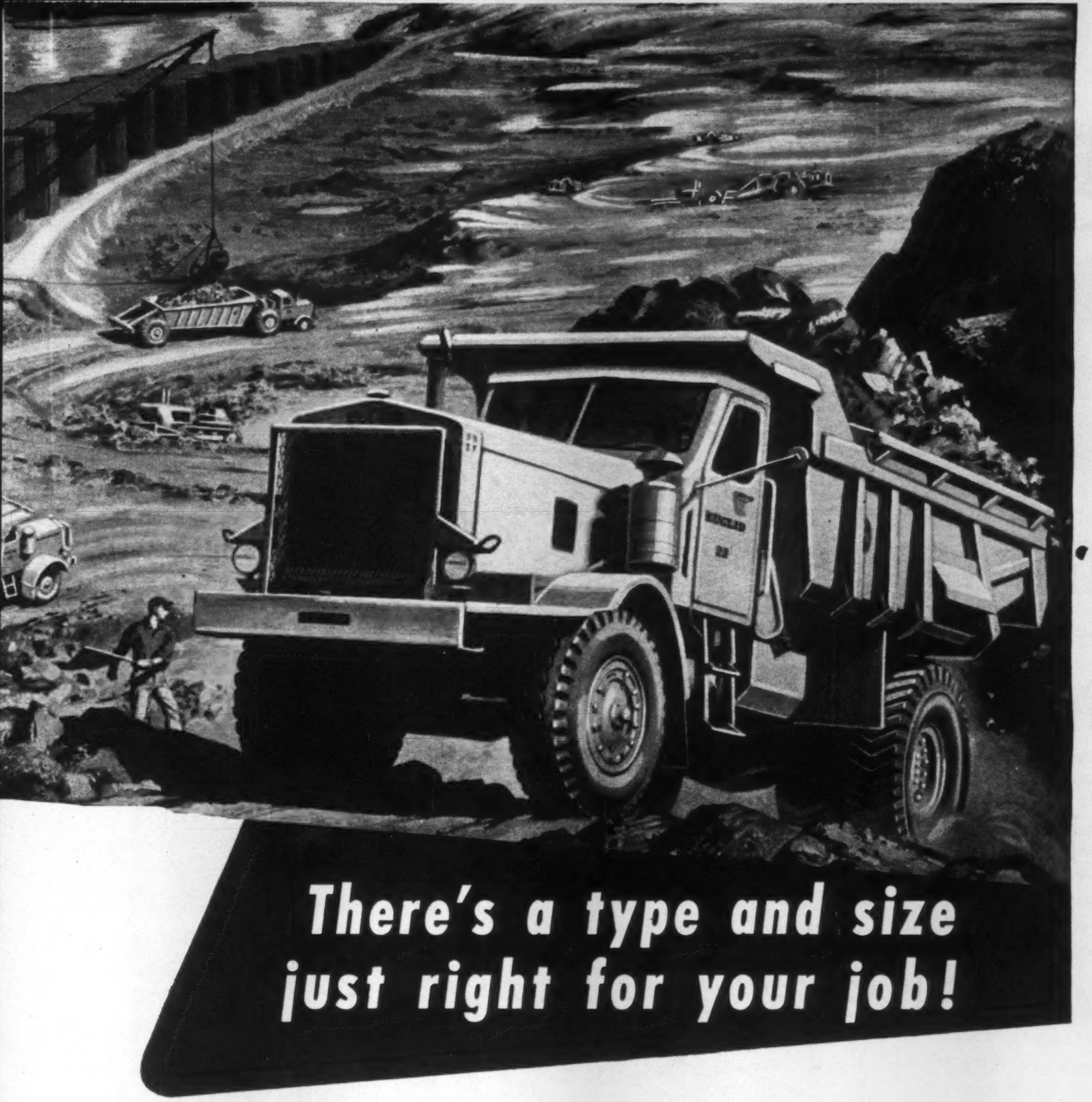
BUILDINGS—SLC

▲ **Mo., Kansas City**—Rockhurst Bd. Regents, Rockhurst College, 53 and Troost, soon lets contract 3 story, 272,150 sq. ft. HS-CLASSROOM, 2 story, 110 x 193 ft. GYMNASIUM and CAFETERIA; FACULTY RESIDENCE. $2,150,000. Shaughnessy, Bower & Grimaldi, 3543 Broadway, Kansas City, Mo., archts. CD 7/20/61.

BUILDINGS—LB & CA

▲ **B. E. Rountree**, Bobbie Downs Apartments, 910 Bobbie Downs Dr., Hazelwood, Mo., Owner Builds, **$2,000,000**, 110 two story 4 units each APARTMENTS, incl. Olympic size swimming pool, recreational facilities, civic center, north of Northland Shopping Center, FERGUSON (ST. LOUIS 35 P.O.), MO.

(Continued on page 91)


There's a type and size just right for your job!

Whatever your off-highway hauling work may be—heavy construction, mine, quarry and industrial jobs—there's a job proved "Euc" that can cut your costs and step up production. With unmatched field experience and parts and service facilities of a world wide dealer organization, Euclid Rear-Dumps meet today's requirements for big performance on the toughest jobs.

For facts and figures proof that "Eucs" can mean lower costs on your work and are your best investment, call the Euclid dealer that serves your area.

EUCLID Division of General Motors, Cleveland 17, Ohio
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

GM GENERAL MOTORS EUCLID

EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

R-10	10 TONS
R-15	15 TONS
R-18	18 TONS
R-22	22 TONS
R-27	27 TONS
R-45	45 TONS
R-62	62 TONS

PLUS

12, 22 and 35-TON
Semi-Trailer Rear-Dumps

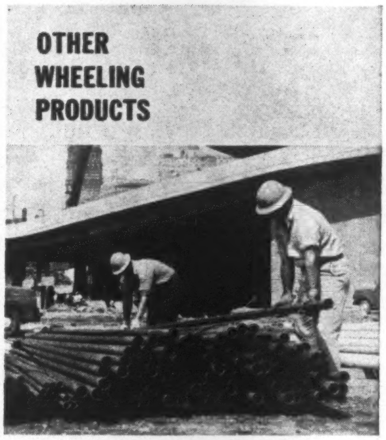
Today, you'll find more and more walkways, stairs, mezzanines and skywalks are made of Wheeling Expanded Metal. That's because unwanted rain, snow, sleet, mud, oil and grease go right through it. So does light, heat and fresh air. No wonder it pays $$$ to specify Wheeling Expanded Metal!

Wheeling
CORRUGATING COMPANY

WHEELING CORRUGATING COMPANY • IT'S WHEELING STEEL!

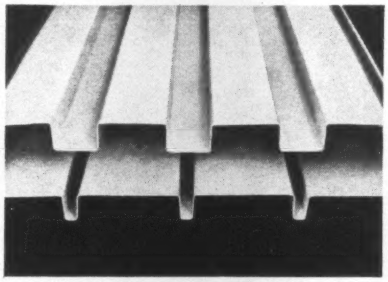
Steel

Warehouses: *Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Martins Ferry, Minneapolis, New York, Philadelphia, Richmond, St. Louis.* Sales Offices: *Atlanta, Houston, New Orleans*

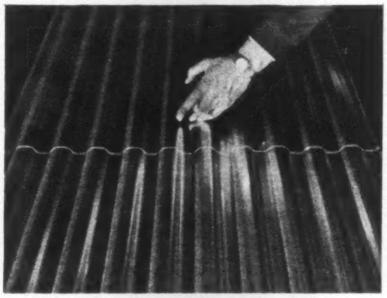


OTHER WHEELING PRODUCTS

Wheeling Continuous Weld Steel Pipe gives strong, dependable, low-cost service . . . usually outlasts the building itself.



NEW, STRONGER Wheeling Super-Rib Steel Roof Deck has an exclusive vinyl protective coating . . . comes in unlimited lengths.



Wheeling Tensilform® . . . with conventional or light aggregate concrete . . . gives structures excellent lateral stability.

Wheeling SofTite® Cop-R-Loy® Galvanized Steel Sheets, for heating and air-conditioning ducts, will not flake or peel under rough use.

(Continued from page 88)

▲ **Harold A. Schulenberg Co.**, 7925 Clayton Rd., Clayton 17, Mo., Owner Builds, **$2,000,000** $800,000 1st year. (3 Year Program) 100 RESIDENCES, Twin Fawns Estates, Geyer Rd. north of Manchester Rd., ST. LOUIS COUNTY, MO.

▲ **Dyer Constr. Co.**, Lone Star Gas Bldg., Dallas, Tex., CA Est. **$10,000,000**, First phase 22 story APARTMENT, Blackburn St., Oak Lawn Ave., Turtle Creek Blvd., 1st phase, DALLAS, TEX. Turtle Creek Towers North, Inc., (Daniel Gevinson) c/o contractor. John Hans Graham & Associates, 2000 K N.W., Wash., D. C., archts. CD 4/9/59, under Daniel Gevinson, as owner.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **California**—BA 8/28—Sonoma County Flood Control and Water Conservation Dist., County Admin. Bldg., 2555 N. Mendocino Ave., San Rosa, CLEARING, EXCAV., EMBANKMENT, concrete work, pipe, etc. Santa Rosa Creek Reservoir and Spring Creek Dam and Diversion near Sonoma, Sonoma Co. **$1,498,060.** **(Correction bid date).** CD 7/28/61.

▲† **California**—BA 9/19—Bureau Reclamation, Dpt. Interior, Lewiston, completion Trinity POWERPLANT approx. 8 mi. northeast of Lewiston, Trinity Co.; Spring Creek POWERPLANT, approx. 6 mi. northwest of Redding; Clear Creek POWERPLANT and SWITCHYARD approx. 12 mi. southeast of Lewiston, Shasta Co., Spec. No. DC 5640. CD 9/16/57.

BUILDINGS—BA

▲ **Utah, Provo**—BA 8/28—Brigham Young University, Provo, FINE ARTS CENTER. **$2,500,000.** Plans deposit $150. William Pereira & Assocs., 5657 Wilshire Blvd., Los Angeles, Calif., archts. CD 1/11/60.

▲† **Calif., Los Angeles**—BA 9/1—General Services Admin., 49 Fourth St., San Francisco, Central POST OFFICE GARAGE (Terminal Annex). $3,000,000. CD 8/18/58.

▲ **Calif., Los Angeles**—BA 9/7—University of California at Los Angels, 405 Hilgard Ave., 192,000 sq. ft. RESIDENCE HALL NO. 3, $4,097,000. Plans deposit $400. Welton Becket & Assoc., 10000 Santa Monica Blvd., archts. CD 6/23/61.

▲ **Calif., Sacramento**—BA 9/20—Bd. Supervs. Sacramento Co., County Admin. Bldg., 827 Seventh St., JUVENILE HALL and RELATED FACILITIES. $2,600,000. Raymond R. Franceschi, 2636 Fulton Ave., archt. CD 3/14/60.

HEAVY CONSTRUCTION—LB & CA

▲ **ARIZONA**—State Hy. Dpt., 206 S 17th Ave., Phoenix, ROADS,

Ariz.—**Vinnell Corp.**, P.O. Box 8097, Phoenix 41, Ariz., CA **$2,766,524**, est. $2,673,966, (2 bidders), eastbound roadway and westbound roadway, incl. grading, draining, furnishing, placing select material, cement treated base, bit. road mix and asphaltic conc., furnishing and applying an emulsified asphalt seal coat constr. two 3 span rein.-con. continuous span overpasses, U. S. Rte. 66, 15 mi. east of Sanders, extending easterly over U. S. Rte. 66 toward Lupton, 3 mi. Holbrook-Lupton Hy., Apache Co., CD 7/7/61;

Ariz.—**Vinson Constr. Co.**, P.O. Box 830, Phoenix 1, Ariz., CA **$646,538**, est. $545,080, (5 bidders), widening roadway, grading, draining, furnishing, placing, select material, aggregate base, b. conc. asphl. conc. for finishing course, conc. pipe, beginning at Roanoke Ave., extending North over Central Ave. to Turney Ave., U. S. 221 (5). North Central Ave. (Roanoke Ave.-Turney Ave.) City of Phoenix, Maricopa Co. BA 7/28/61, CA 7/28/61. CD 7/12/61, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 8/3, ROAD,

Gordon H. Ball and Gordon H. Ball, Inc., 300 Camille Ave., Danville, Calif., LB **$3,922,222** (5 bidders), grading, paving 5.5 mi. four lane freeway State Sign Rte. 126 between US Hy. 101 in Ventura and 0.1 mi. east of Wells Rd., Ventura Co. CD 6/28/61.

▲ **Riha Constr. Co.**, 8150 Center St., **La Mesa, Calif.**, CA **$2,501,822**, SMALL CRAFT HARBOR, incl. paving, utilities, moorings and buildings, OCEANSIDE, CALIF. Bd. Dirs. Oceanside Small Craft Harbor Dist., 704 Third St., Oceanside, Calif. BA 7/31, CA 8/1. CD 8/3/61, under LB.

BUILDINGS—LB & CA

▲ **Manhatten-Dickmann Constr. Co.**, 320 East Camelback Rd., Phoenix, Ariz., CA **$3,292,771**, HIGH SCHOOL, 59th Ave. and Osborn Rd., PHOENIX, ARIZ. Phoenix Union High School-College System Bd., City Hall, Phoenix, Ariz.

▲ **Walker Boudwin Constr. Co.**, 624 E. 4th St., and **McKenzie Constr. Co.**, 560 Kietzke Lane, Reno, Nev., CA **$3,041,000**, HIGH SCHOOL, RENO, NEV. Wahoe County School Dist., 139 W. 6th St., Reno, Nev. BA 7/6/61. CD 7/28/61, under LB.

▲ **George A. Fuller Co.**, 597 Madison Ave., New York, N. Y., CA **$15,000,000**, six APARTMENTS, PACIFIC PALISADES, CALIF. Wilson Park, Inc., Pacific Palisades, Calif. Pollock & Drazen, Inc., Pacific Palisades, Calif., archts.

▲ **Ralph M. Parsons Co.**, 1801 E. Sepulveda, Long Beach, Calif., CA PHTHALIC ANHYDRIDE PLANT, EL SEGUNDA, CALIF. Allied Chemical Corp., 61 Broadway, New York 6, N. Y.

▲ **Tartan Homes, Inc.**, 3800 E. Coast Hy., Corona del Mar, Calif., Owner Builds, **$2,602,840**, 205 frame, stucco DWELLINGS, Tract 4025, SANTA ANA, CALIF.

▲ **Hawaiian Dredging & Constr. and Bechtel Corp.**, 1350 Ala Moana Blvd., Honolulu, Hawaii, CA **$5,324,000**, 82,500 kilowatts GENERATING PLANT,

(Continued on page 94)

DOWN TO FUNDAMENTALS

WITH YOU IN MIND

KERN instruments are functional, job-designed for a specific range of work.

KERN instruments are streamlined, compressed into minimum possible size...lightweight, portable.

KERN instruments are eminently field-worthy, rugged, stable, designed to stay operational under severe climatic conditions.

KERN instruments assure simplicity and economy with fast,effortless operation.

KERN instruments are manufactured with meticulously precise workmanship and strict quality control.

KERN optics are designed for maximum definition resolving power and brightness for specific ranges of work.

KERN gives you more instrument for your money through down-to-fundamentals design. Concentration on precision, speed and reliable accuracy of results.

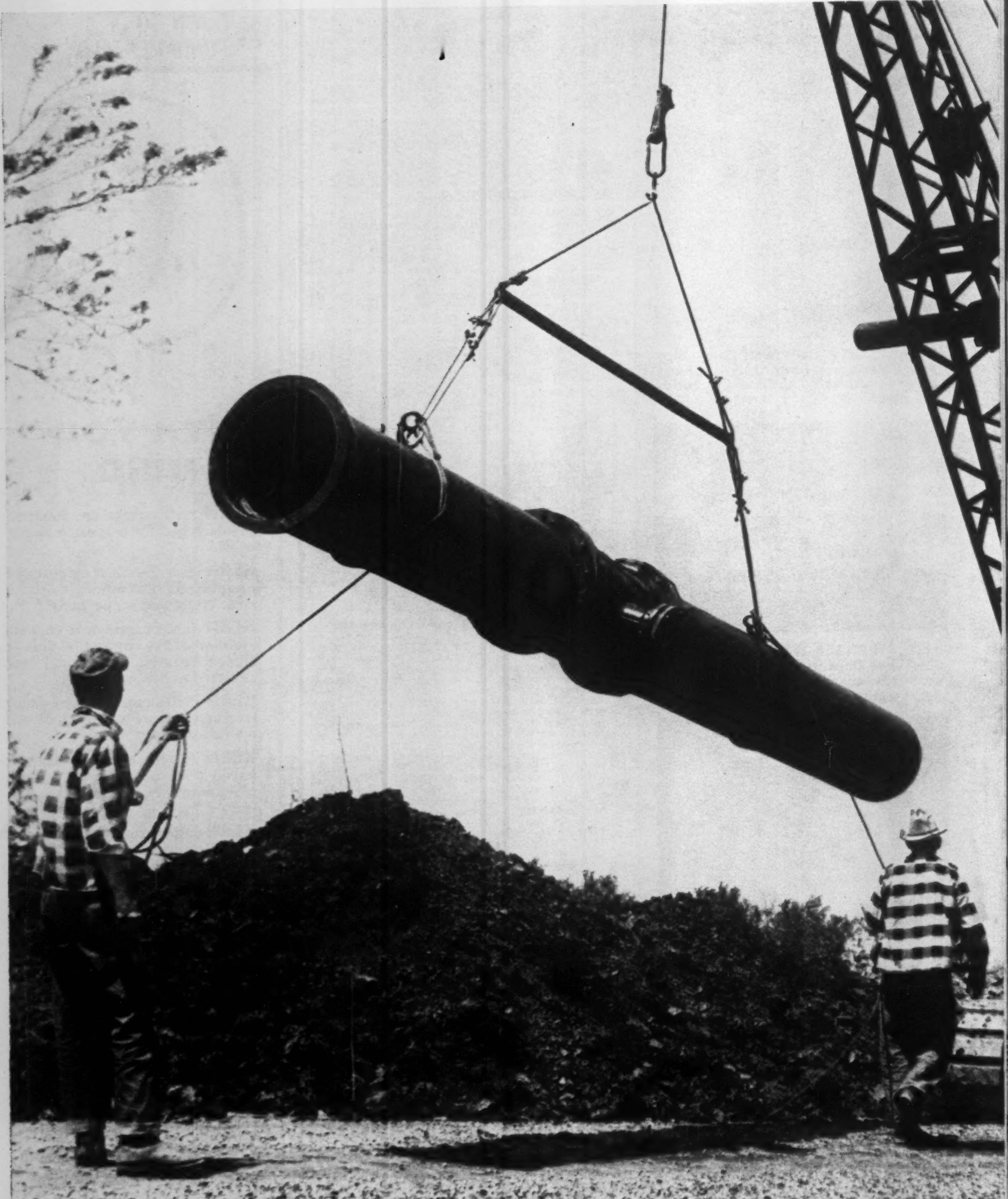
KERN tripods are functional and radically new in concept — assure maximum stability and minimum set-up time. They round out the down-to-fundamentals concept of KERN equipment.

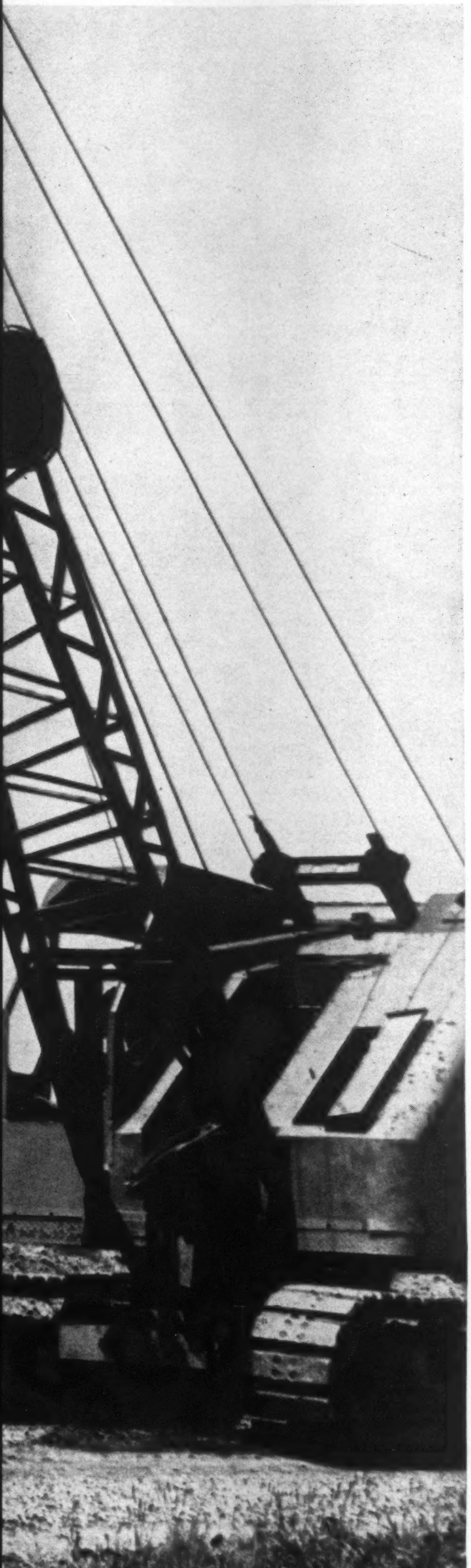
KERN instruments are cared for by factory-trained technicians if need arises.

YOU CHOOSE WISELY WHEN
YOU CHOOSE KERN

PROMPT, RELIABLE SERVICE
FACTORY TRAINED TECHNICIANS

KERN
INSTRUMENTS, INC.
FUNDAMENTAL SURVEYING EQUIPMENT
120 Grand St., White Plains, N.Y.





PIPE THAT SHOULDERS A HEAVY LOAD WITHOUT SHOWING ITS AGE

Recently installed in a town in Illinois, this cast iron pipe water supply system now serves a large industrial area.

Besides the internal pressure of supplying the heavy daily demand, there is a heavy load overhead, too. The industrial area is a packaging and distribution center. Large numbers of fully loaded rail cars and trucks come and go every day.

As far as the cast iron pipe is concerned, this is all in a day's work.

Cast iron pipe shoulders heavy loads—interior and exterior—year after year; performs efficiently for a century or more.

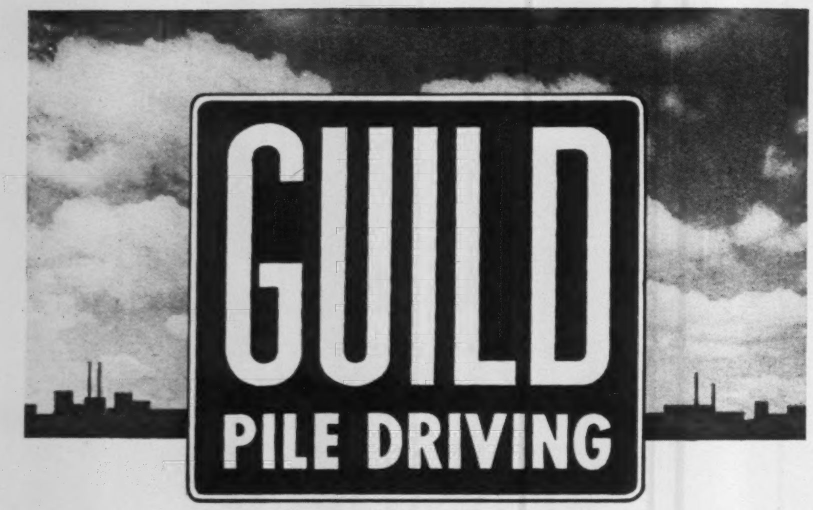
And it always delivers a full flow of water.

Advertising campaign from Cast Iron Pipe Research Association shoulders a heavy load, too!

For years the Cast Iron Pipe Research Association has attacked the water problem nationally; now, in addition, it is undertaking a new campaign to combat this crisis on a local level. Car cards, speeches, radio spots, newspaper ads, mailing pieces—everything will be included. If your town's problem is apathy or a growing water shortage, we may be able to help. For complete details, write to the Cast Iron Pipe Research Association today!

CAST IRON PIPE RESEARCH ASSOCIATION
Thos. F. Wolfe, Managing Director
3440 Prudential Plaza, Chicago 1, Illinois

CAST IRON PIPE
THE MARK OF THE 100-YEAR PIPE



Call C. L. Guild Construction Co. for estimates on any type piling job — anywhere in the country

- CAST-IN-PLACE
- WOODEN PILES
- COMPOSITE PILES
- STEEL H PILES
- PIPE PILES
- STEEL SHEET PILING

SPECIALISTS IN THE USE OF COBI PILES

Guild engineers, whose training and knowledge has been proved on some of the toughest pile driving jobs in the country, can help you with your foundation problems. There's a Guild office near you.

C. L. GUILD CONSTRUCTION CO., INC.

90 Water Street, East Providence 14, R. I.

BOSTON, MASS.
SYRACUSE, N. Y.
WASHINGTON, D. C.
ATLANTA, GA.
HOUSTON, TEXAS
KANSAS CITY, MO.

BEFORE YOU START THAT WET JOB

Ask How You Can Save

MORETRENCH WELLPOINT SYSTEM

Guarantees Dry Digging

Send for Catalog

MORETRENCH CORPORATION

World's Oldest, Largest and Most Experienced Predrainage Organization

Main Office & Plant: **Rockaway, N. J.**

Chicago, Ill., Tampa, Fla., Houston, Tex., Hackensack, N. J.

(Continued from page 91)

Kahe Valley, HAWAII. Hawaiian Electric Co., 900 Richards St., Honolulu, Hawaii. CA 7/31. CD 5/17/60.

CANADA

BUILDINGS—BA

▲ **Ont., Toronto**—BA 8/25—Imperial Oil Ltd., 111 St. Clair Ave., 3 story, 100 x 350 ft., concrete, steel air-conditioned OFFICE, Flemington Park Development, Eglinton Ave. E., Don Mills Rd. $2,000,000. John B. Parkin Assocs., 1500 Don Mills Rd., archts. CD 6/6/61.

HEAVY CONSTRUCTION—SLC

▲ **Newfoundland, St. George's Bay**—Newfoundland Gypsum, c/o Flintkote Co. of Canada Ltd., 30th St., New Toronto, Ont., soon lets contract. DOCK, CAUSEWAY, CRUSHING FACILITIES, roadway, existing facilities addns. $1,900,000. Giffels & Vallet of Canada Ltd., 181 Eglinton Ave., Toronto, Ont., and Frederic R. Harris of Canada Ltd., 8 Spadina Rd., Toronto, Ont., engrs.

HEAVY CONSTRUCTION—LB & CA

▲ **Carter Constr. Co., Ltd.**, 419 Cherry St., Toronto, Ont. LB **$10,733,000**, (7 bidders), TERMINAL GRAIN ELEVATOR NO. 4, marine towers, service bldg., substation and shipping gallery, elevator storage, outside services, Montreal Harbor, MONTREAL, QUE. National Harbors Bd., Hunter Bldg., Ottawa, Ont. BA 8/3/61. CD 7/26/61.

▲ **Shawinigan Engineering Co. Ltd.**, 625 Belmont Ave., Montreal, Que., CA Est. **$44,000,000**, 113,500 kw HYDRO-ELECTRIC DEVELOPMENT, Upper St. Maurice River, RAPIDE DES COEURS, QUE. Shawinigan Water & Power Co., 600 Dorchester St. W., Montreal, Que. CD 3/29/61, under Que., Shawinigan, as project location.

BUILDINGS—LB & CA

▲ **Peter Leitch Constr. Ltd.**, 170 Scott St., Winnipeg, Man., CA Est. **$1,700,000**, CANCER CLINIC, WINNIPEG, MAN. Manitoba Cancer Foundation, 700 Bannatyne Ave., Winnipeg, Man. BA 6/22/61. CD 6/12/61.

▲ **M. Sullivan & Son Ltd.**, Elgin St., Arnprior, Ont., CA Est. **$2,500,000**, 5 story TELEPHONE EXTENSION BLDG., Albert and O'Connor Sts., OTTAWA, ONT. Bell Telephone Co. of Canada, 1050 Beaver Hall Hill, Montreal, Que. BA 7/19/61. CD 7/14/61.

▲ **Perini Ltd.**, 49 Jackes Aves., Toronto, Ont., LB **$5,670,000**, (6 bidders), Ryerson INSTITUTE of TECHNOLOGY WING, TORONTO, ONT. Dpt. P. Wks., Parliament Bldg., Toronto, Ont. BA 8/2/61. CD 7/12/61.

▲ **Magloire Cauchon Ltee**, 241 de la Salle St., Quebec City, Que., CA Est. **$2,000,000**, 7 story, 56 x 258 ft. rein-con., frame, slab, stone, brick HOSPITAL, Ave. du Sacre Coeur, QUEBEC CITY, QUE. Hospital du Sacre-Coeur, Ave. du Sacre Coeur, Quebec City, Que. Pierre Rinfret, 1134 St. Louis St., Quebec City, Que., archt.

PUERTO RICO

BUILDINGS—LB & CA

▲ **Puerto Rico, Aguadilla**—BA 9/1—Puerto Rico Urban Renewal & Housing Corp., P.O. Box 397, Rio Piedras, 31-300 unit rein.-con. PUBLIC HOUSING, PR-3-86. $3,000,000. Font & Montilla, P.O. Box 9611, San Juan, Puerto Rico, archts.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **Reynolds Constr. Co.**, 120 Wall St., New York, N. Y., U. S. A., CA Est. **$4,000,000**, HANGARS, ENGINE MAINTENANCE SHOPS, SERVICE BLDGS., International Airport, Addis Ababa, ETHIOPIA. Minister P. Wks. & Communications, Imperial Govt. Ethiopia and Ethiopian Airlines, Addis Ababa, Ethiopia.

▲ **Morrison-Knudson Co., Inc.**, 319 Broadway, Boise, Idaho, U.S.A. LB **$5,385,999**, Yojoa Rio-Lindo HYDROELECTRIC Proj. near Lake Yojoa, HONDURAS. Empresa Nacional de Energia Electrica, Apartado Postal 99, Tegucigalpa, D. C., Honduras. BA 5/31. CD 5/4/61.

BUILDINGS—LB & CA

▲ **Bechtel International Corp.**, 485 Lexington Ave., New York 17, N. Y., CA Est. **$10,000,000**, HOTEL, FRANKFURT, GERMANY. Intercontinental Hotels Corp., 135 E. 42 St., New York 17, N. Y., U.S.A. Otto Apel, Frankfurt, Germany, archt.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

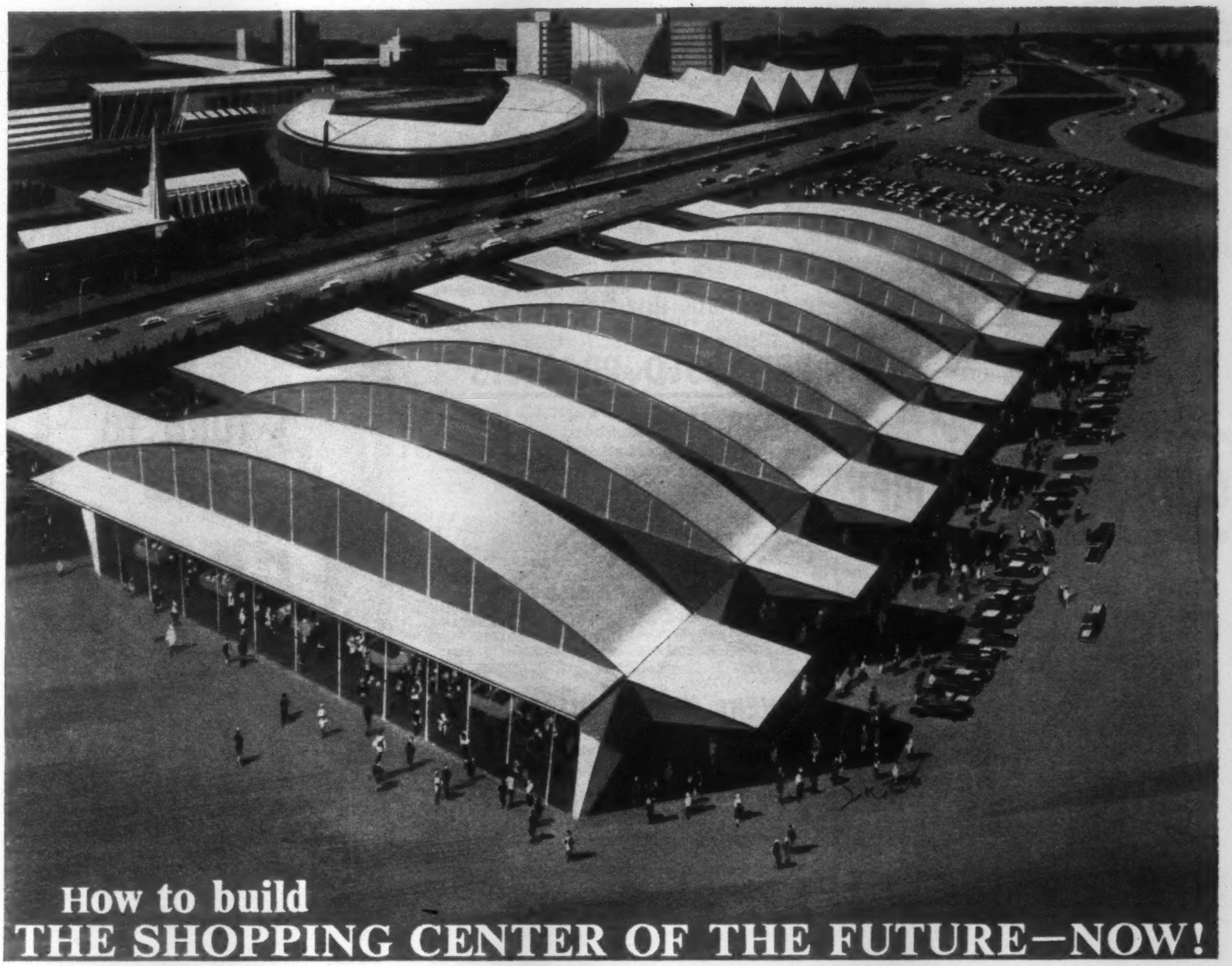
▲ **ARGENTINA**—Dir. Prov. Vialidad Calle 7, 1175 La Plata, Buenos Aires, ROAD,

Gabaco S. A. Constr. Civiles, Alsina 1441, Buenos Aires, Argentina CA **$3,618,000**, est. $4,371,000, 101.5 klm. basic work and flexible paving, Section II and R. 33, Guamini-T. Lauquen, Trenque Lauquen, Buenos Aires Prov. BA 7/28.

BUILDINGS—LB & CA

▲ **Friedrich Uhde, G.a.H.**, Degging Str. 10-12, Dortmund, **Hochtief A.G. Bockenheiner Landstr. 24**, Frankfurt (Main), and **Ferrostall A.G.**, Schliesffalk, Essen, all West Germany, CA Est. **$15,000,000**, FERTILIZER

(Continued on page 96)



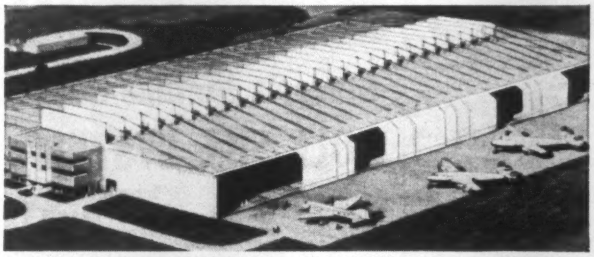
How to build
THE SHOPPING CENTER OF THE FUTURE—NOW!

In this shopping center of the future, the suspended roof would leave every square foot of interior space completely unobstructed. An artist's conception, yes — but this is no unattainable "dream building." Modern suspended roof techniques pioneered by Roebling make it practical and economical *now*.

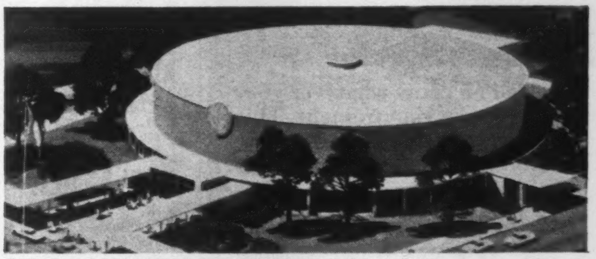
Consider the down-to-earth advantages. Floor space for supports would become paying space instead. Merchandise would be handled, displayed and sold with new ease and efficiency. Customer traffic would move faster with fewer obstructions. Add low first cost and the prospect becomes even more alluring!

Suspended roofs are paying off handsomely in many types of buildings — plants, gymnasiums, airline terminals and hangars, auditoriums, stadiums and others.

Roebling's great experience with steel in tension enables it to take an active leadership in the suspended roof field. This experience is available to you. For information please call or write Roebling's Bridge Division, Trenton 2, New Jersey.



SUSPENSION ROOFS NOW AT WORK . . .
TWA HANGAR – MID-CONTINENT INTERNATIONAL AIRPORT, KANSAS CITY • Designed by Burns & McDonnell, Kansas City • Ammann & Whitney, Consulting Engineers, New York City • Contractors: MacDonald-Creighton, St. Louis and Nashville • Cables by Roebling



UTICA MEMORIAL AUDITORIUM, N. Y. • Architects: Gehron & Seltzer, New York City • Associate Architect: Frank C. Delle Cese, Utica • Consulting Engineer: Dr. Lev Zetlin, New York City • Contractor: Sovereign Construction Company, Ltd., Fort Lee, N. J. • Roof Supporting Structure, Including Cables, Furnished and Erected by Roebling

ROEBLING

Branch Offices in Principal Cities • John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

Don't Gamble

...you KNOW

CLOW CAST IRON PIPE

will last over 100 years!

Don't take a chance that breakage, leakage, deterioration and all the many other problems substitute pipe can bring will come back to haunt you. Cast iron pipe is the only real economy, the only truly low-cost pipe.

Why gamble when you KNOW that CLOW cast iron pipe will serve for over a century...is the *only* time-proven material?

Call on CLOW whatever your waterworks requirement. Our facilities, experience and manufacturing skill are at your service.

JAMES B. CLOW & SONS, Inc.
201-299 North Talman Avenue
Chicago 80, Illinois

Subsidiaries:
EDDY VALVE CO. • Waterford, N.Y.
IOWA VALVE CO. • Oskaloosa, Iowa

CLOW CAST IRON PIPE

(Continued from page 94)

PLANT in Cuzco, PERU. Ministry of P. Wks., Govt. of Peru, Lima, Peru. BA 4/15. CD 2/27/61.

FOREIGN

▲ **Citra Aust.**, Sidney, Australia, CA Est. **$2,218,412,** Bourumba DAM, Yabba Creek, 30 mi. southwest of Gympie, AUSTRALIA. Queensland Irrigation & Water Supply Comn., Brisbane, Australia.

BUILDINGS—LB & CA

▲ **Imperial Chemical Industries Ltd.**, 380 Collins St., Melbourne, Victoria, Australia, Owner Builds, **$13,440,000,** AMMONIA METHANOL PLANT, BOTANY, AUSTRALIA.

Abd al-latif Jassim al-Ani, Baghdad, Iraq, CA **$5,077,800,** 2 multi-story BUILDINGS, Karkh Section, BAGHDAD, IRAQ. Ministry Wks. and Housing, Baghdad, Iraq.

For additional reports see CONSTRUCTION DAILY REPORTS SECTION

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ind., East Chicago**—City, City Hall, WATER FILTRATION PLANT. **$5,000,000.** Consoer, Townsend & Assocs., 360 E. Grand Ave., Chicago 11, Ill., consult. engrs. BA 11/61. CD 5/19/58.

▲ **N. Y., Hamburg**—Town of Hamburg, 501 South Park Ave., WATER TREATMENT PLANT, incl. 1,800 ft. outfall lines in Lake Erie. **$3,000,000-$3,500,000.** Cherry & Preble, 87 West Tupper, Buffalo, consult. engrs. Bids in Fall. CD 6/17/58.

▲ **Wis., Wauwatosa** — City, City Hall, First Stage, WATER TRANSMISSION LINE CONNECTION with Milwaukee; 2½ m.g. ELEVATED STORAGE TANK; 2½ m.g. GROUND STORAGE TANK; BOOSTER PUMP STATIONS. **$3,000,000.** Consoer, Townsend & Assocs., 360 East Grand Ave., Chicago 11, Ill., consult. engrs. CD 4/20/55.

SEWERS, WASTE DISPOSAL

▲ **Calif., Ventura**—Ventura River Municipal Water Dist., 1055 Ventura Ave., Oak View, INTERCEPTOR and TRUNK SEWER, TREATMENT PLANT to serve Ventura, Ojai, Meiners Oaks, Oak View, Casitas Springs, Foster Park, **$2,130,000.** BA 7/62.

▲ **N. J., Newark**—Passaic Valley Sewerage Comn., 790 Broad St., REHABILITATION NEWARK BAY PUMPING STATION. **$2,900,000.** Metcalf & Eddy Engineers, 1300 Statler Bldg., Boston 16, Mass., consult. engrs. CD 7/28/61.

▲ **Tex., Amarillo**—City, City Hall, voted bonds July 25, SEWER IMPRVS., incl. extensions to exist. 4.5 MGD sewage treatment plant, new 4.5 MGD sewage treatment plant and sew. collector and outfall lines. **$5,800,000.** Freese, Nichols & Endress, 407 Danciger Bldg., Fort Worth, consult. engrs. CD 7/10/61.

▲ **Ont., Hamilton** — City, City Hall, INCINERATORS, Bay, Simcoe and Strachan Sts. **$2,263,000.** CD 2/6/56.

BRIDGES

▲ **QUEBEC**—Provincial Dpt. Roads, Parliament Bldgs., Quebec City, BRIDGE,

Quebec City—over or underpass on St. John's Rd. at CNR and CPR Crossing, Pointe Claire, **$2,000,000.** Bids soon.

EARTHWORK, WATERWAYS

▲ **Fla., Sarasota**—Bd. Comrs. Sarasota Co., Courthouse, Philippi Creek FLOOD CONTROL PROJECT in South Gate section, incl. dam, bulkheads. **$2,000,000.** Smalley, Wellford & Nalven, 133 S. McIntosh Rd., consult. engrs. CD 12/16/60.

▲ **Texas**—Hale County Soil Conservation Dist., Flip Calhoun Bd. Chrm., Plainview, FLOOD CONTROL, DAM and RESERVOIR, Running Water Draw, west of Plainview. **$3,000,000.**

AIRPORTS

▲† **Calif., Castle Air Force Base**—U. S. Eng., 1208-8 St., Sacramento, plans by Stone, Marraccini & Patterson, 536 Mission St., San Francisco, 50 bed HOSPITAL. **$1,780,000.** Bids August 1961.

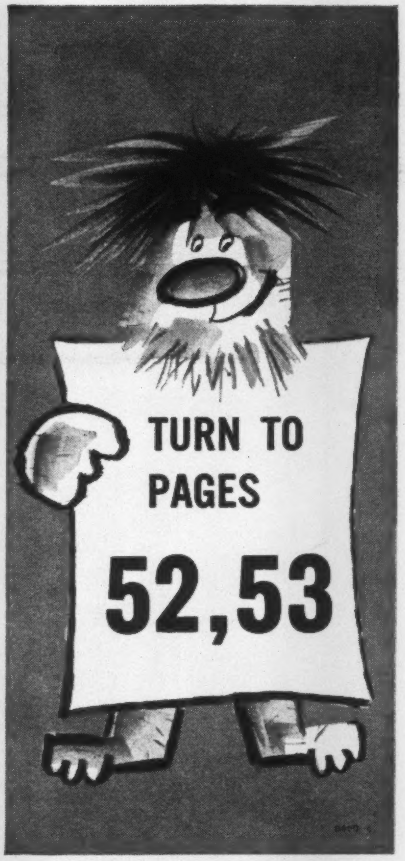
UNCLASSIFIED

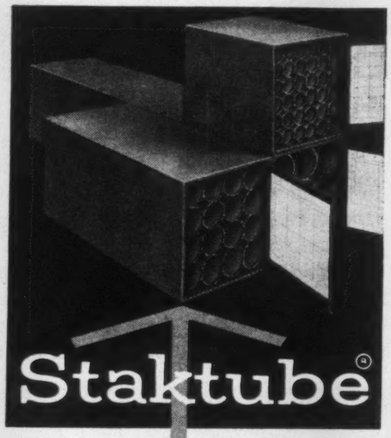
▲ **N. Y., Flushing**—Italian Commercial Consul, 666 Fifth Ave., New York, Zone 19, EXHIBITION PAVILION, World's Fair Exhibit. **$5,000,000.** CORRECTION-owner and address). CD 7/12/61.

PUBLIC BUILDINGS

▲ **Ga., Atlanta**—State Office Bldg. Auth., State Capitol, plans by A. Thomas Bradbury & Assocs., 60 5th St. NE, ARCHIVES and RECORD BLDG., parking deck, Capitol Ave. and Frazier St. on Capitol Square, **$7,000,000.** Ammons, McClure & Caldwell, 18 Peachtree Place, NE, and Morris Harrison, 770 Spring St., NW, mech. engrs. CD 1/30/58.

▲ **N. Y., Brooklyn**—State Dpt. P. Wks., State Office Bldg., Albany, plans by Urbahn, Brayton & Burrows, 635 Madison Ave., New York, Zone 21, 8 story U-shaped HOSPITAL, Clarkson Ave., E. 37 St., Lenox





Staktube®

Stacor's lifetime steel

ROLL FILE SYSTEM

"Easy-file easy-find" system to keep rolled prints, plans, maps clean, safe. 32 sizes—8 lengths, 4 tube diameters.

Send NOW for illustrated catalog

STACOR EQUIPMENT CO.
279 Emmet St., Newark, N. J.
Phone: BIgelow 2-6600

Rd. and Brooklyn Ave. for State University of New York at Downstate Medical Center. **$20,000,000.** DiStasio & Van Buren, 4 Albany St., New York 6, N. Y., struct. engrs. Seelye-Stevenson-Value & Knecht, 101 Park Ave., New York 17, N. Y., mech. engrs. CD 7/17/61.

▲ **N. C., Greenville**—Greenville Housing Auth., City Hall, plans by Dudley & Shoe, 26 Rivers Bldg., 209 Evans St., 225 unit low rent HOUSING, **$2,250,000.**

▲ **O., Cincinnati**—Forest Hills School Dist., 7537 Beechmont Ave., **$1,560,000** bond election Nov. 7, Wilson ELEMENTARY SCHOOL ADDN., SENIOR HIGH SCHOOL ADDN. Garriott & Becker, 2414, Grandview St., archts. Green & Simes, Wooster Park, Mariemont, consult. engrs. Herschel West c/o owner, engr. CD 6/17/59.

▲ **O., Mansfield**—Bd. Comrs. Richland Co., Courthouse, $3,750,000 bond election Nov. 7, COURTHOUSE, **$2,800,000.** CD 11/15/60.

▲ **Tenn., Memphis**—City, City Hall, plans by Eason, Anthony, McKennie & Cox, 1391 Madison Ave., RESEARCH HOSPITAL, Russwood Park, **$3,125,000.** Bids in August 1962.

▲ **Tex., Austin**—University of Texas, c/o Bd. Regents, Main Admin. Bldg., plans by Barnes, Landes, Goodman & Youngblood, assoc. archts., 1013 E. 38½ St., and Jessen, Jessen, Milhouse & Greeven, consult. archts., 2816 Hemphill Park, MARRIED STUDENTS HOUSING, **$2,000,000.** CD 7/31/61.

▲ **Wis., Menomonee Falls**—Menomonee Falls Public Schools plans by Kloppenburg & Kloppenburg, 5906 N. Port Washington Rd., Milwaukee, INTERMEDIATE SCHOOL. **$1,600,000.**

▲ **Wis., Milwaukee**—Bd. Regents University of Wisconsin, Madison, plans by M. Meyer & Assocs., 799 Jefferson St., STUDENT UNION BLDG. ADDN. **$1,712,593.**

▲ **Ont., Bell's Corners**—Nepean Dist. High School Bd. plans by Burgess, McLean & MacPhayden, 226 MacLaren St., Ottawa, HIGH SCHOOL. **$2,350,220.**

COMMERCIAL BUILDINGS

▲ **Calif., Los Angeles**—California Lutheran Hospital, A.K.A. California Hospital, 1414 S. Hope St., plans by Walker Kalionzes & Klingerman, 488 S. San Vicente Blvd., 9 story, rein.-conc. HOSPITAL ADDN. **$3,000,000.** Bids December 1961. CD 3/7/46.

▲ **Calif., Palo Alto**—Alhouse Realty, Inc., c/o A. C. Prentice, archt., 2450 El Camino Real, three 6 story, 200,000 sq. ft. OFFICE, El Camino Real near Stanford Industrial Park. **$1,500,000.** Bids within year.

▲ **Calif., Richmond**—John M. Stahl Co., 321 S. San Vicente, Los Angeles, Calif., plans by Donald Hardison & Assoc., 160 Broadway, 600 unit APARTMENT, incl. playgrounds, swimming pools, 35 acre site south of Rolling Hills Memorial Park Development. **$5,000,000.**

▲ **Conn., Ledyard**—Roland Aubin, Pleasant Valley Rd., South Windsor, 220 HOUSES, Christy Hill Estates, Second Section. **$2,200,000.**

▲ **Fla., Miami Beach**—King Cole Apartments Corp., c/o Fridstein & Fitch, archts., 228 N. LaSalle St., Chicago, Ill., 245 units, 10 story APARTMENT, 6845 Bay Dr. **$2,000,000.**

▲ **La., New Orleans**—Tulane University, 6823 St. Charles Ave., plans by Dibolls-Kessel & Assoc., 637 Pere Antione Alley, 12 story Men's RESIDENCE HALL, **$2,300,000;** 2 story, 30,000 sq. ft. FOOD SERVICE BLDG. **$700,000.**

▲ **Mass., Boston** — New England Deaconess Hospital, Deaconess Rd., preliminary plans by Gulesian, Peirce & Pierce, 9 Arlington St., Boston, Mass., CANCER RESEARCH CENTER. **$1,800,000.** Bids September-October. CD 7/13/61.

▲ **Mass., Cambridge**—Riverview Development, First Realty Co. of Boston, 11 Pemberton Sq., Boston, Mass., plans by Harris & Freeman, Inc., 1640 Mass. Ave., one 7 story and one 3 story (79 units) APARTMENT. **$1,750,000.** Bids September 1961.

▲ **N. J., Clinton**—Walter Busher, Union Rd., 105 HOUSES, Union Rd. **$3,000,000.** John E. Studer, 120 Hy. 22, consult. engr.

▲ **N. Y., Amherst**—Methodist Church Buffalo District, 138 D. Kenville Rd., Buffalo, Zone 15, plans by Duane Lyman & Assocs., 505 Delaware Ave., Buffalo, Zone 2, Niagara Frontier Methodist HOME for AGED. **$1,750,000.**

▲ **N. Y., Fishkill**—Kennicut Development Corp., Waterbury Parkway, Peekskill, 500 one-family HOMES, 350 acre Emmadine Farm property, Taconic State Parkway, East Fishkill. **$7,500,000.** Constr. late in Summer.

▲ **N. Y. New York**—Lexington School for the Deaf, 904 Lexington Ave.. Zone 21, SCHOOL for DEAF, Manhattan. **$4,500,000.** Site not selected.

▲ **N. Y., New York**—Loew's, Inc., 1540 Broadway, Zone 36, plans by Emery Roth & Sons, 400 Park Ave., Zone 22, 30 story HOTEL, Park Ave. and 61 St. northwest corner. **$25,000,000.** Constr. in Summer. CD 7/18/61.

▲ **N. Y., New York**—Mississippi River Development Corp., 383 Madison Ave., will not construct 35 story, 117 x 200 ft. OFFICE, 1320-1326 Sixth Ave. **$10,000,000.** Project abandoned. CD 1/23/61.

▲ **N. Y., New York**—184 E. 84 St. Inc., c/o Cohen Bros. Realty & Constr. Co., 400 Madison Ave., Zone 17, plans by Schuman & Lichtenstein, 360 Lexington Ave., 21 story APARTMENT, southwest corner 3 Ave. and East 84 St. **$5,000,000.** Mayer Assocs., 110 E. 30 St., Zone 16, mech. engrs. CD 8/17/59.

▲ **N. Y., New York**—Walter Reade, Inc., 251 West 57th St., Zone 19, plans by John McNamara, 701

CUT WATER SUPPLY COSTS with REDA Submergible PUMPS

. . . and still obtain maximum water supply and maximum pressure for ALL your water needs. Here's Why:

1. QUALITY CRAFTSMANSHIP . . . Yet production line cost . . . A complete line of 2-pole and 4-pole models to meet operating heads and capacities required. Both electric, submergible motor and pump are REDA manufactured.

2. Oil lubricated motors require less power per H.P. PROVIDE MORE WATER PER DOLLAR than comparable units.

3. Low Installation and Operating Cost. No special piping needed, no drive shafts, rods, belts or gears or costly foundations are required. Operation is completely automatic with minimum controls required.

PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
D-47E	6″	55	2000	200
G-70E	6″	72	5400	180
G-120A	6″	110	3500	105
G-160	6″	150	2750	82
I-200	8″	210	2000	54
FR-300	8″	325	1250	54
J-400	8″	480	780	60

PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
GB-600	10″	600	600	60
KG-725	10″	800	490	69
N-500	10″	425	1100	30
N-750	11″	(c)600*	1000	30
		(a)700		
P-1000	12″	1200	1000	46
R-1500	14″	1800	700	65
T-2000	16″	2250	600	85

*(c) and (a) designate impeller cut within the same pump type.

Models Available from ⅓ to over 300 H.P. Call or Write for Industrial Bulletin R-432 and more complete information.

REDA PUMP COMPANY / BARTLESVILLE, OKLAHOMA

SIGN OF QUALITY SUBMERGIBLE REDA PUMPS

Manufacturer of Submergible, Electric Motors and Pumps for over 40 years. Pumps for Oil, Brine, Water, Gasoline, Jet Fuel, Chemicals, LPG

PHONE FE 6-7900

GUNITE CONCRETE
Since 1915
SAND AND CEMENT
"Placed by Air"

GUNITE
BLO-CRETE WET-CRETE
REFRACTORIES

LINING, ENCASING, FIREPROOFING, REPAIRING

SEND FOR OUR BULLETIN NO. 20

GUNITE CONCRETE & CONST. CO.
1301 WOODSWETHER RD., KANSAS CITY 5, MO.
2016 W. Walnut St., Chicago 12, Ill.
1004 Market St., St. Louis 1, Mo.
3206 Houston St., Houston 9, Texas
Los Angeles — Denver
New Orleans - Minneapolis

DUDGEON HYDRAULIC JACKS

SALES RENTALS
• CAPACITY TO 600 TONS

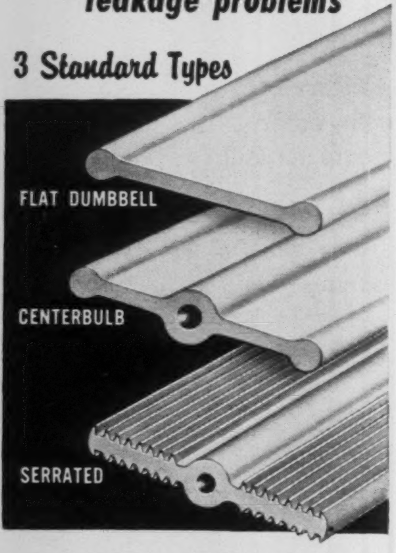
FOR:
PILE TESTING
• UNDER-PINNING
• BRIDGES
• PIPE PUSHING
• SOIL TESTING

Write to Dept. R

RICHARD DUDGEON INC.
789 BERGEN ST. • ST 9-4040 • BROOKLYN, N. Y.

SERVICISED
POLYVINYL PLASTIC WATERSTOPS
will solve your water leakage problems

3 Standard Types



Servicised Dumbbell design waterstops provide a positive, elastic barrier against leakage resulting from hydrostatic pressures. Dumbbell design assures positive sealing action because, as the concrete contracts and opens the joint, the outer anchoring bulbs of the waterstop become more tightly engaged with the concrete. Servicised Polyvinyl Plastic Waterstop will withstand lateral movement without impairing its water sealing properties.

RUBBER WATERSTOPS
2 Standard Types
FLAT DUMBBELL, CENTERBULB

Rubber waterstops are made of a durable, elastic cured rubber compound capable of withstanding considerable movement and both horizontal and vertical shear stresses to insure optimum sealing of joints subjected to hydrostatic pressure. Widely specified and used in installations requiring positive joint sealing.

Write for Catalogs on Servicised Waterstops

Dumbbell design waterstops have been successfully used for over 35 years in major public works structures where heavy hydrostatic pressures have existed.

SERVICISED PRODUCTS CORPORATION
6051 West 65th Street · Chicago 38, Illinois

Seventh Ave., Zone 19, Coronet THEATRE, on top of existing Baronet Theatre, 993-995 Third Ave. **$1,500,000.** CD 10/22/57.

▲ **N. Y., New York**—S. S. Silberblatt, Inc., 25 West 45 St., Zone 36, plans by S. Brian Baylinson, 200 West 57 St., Zone 19, 33 story, 75x76 ft, 145,000 sq. ft. OFFICE TOWER, 600 Third Ave. and 159-163 East 39 St. northwest corner. Over **$5,000,000.** Peter W. Bruder, 200 E. 37 St., Zone 16, mech. and struct. engr. CD 7/21/61.

▲ **N. Y., Syracuse**—Schine Enterprises, Inc., 375 Park Ave., New York, plans by William B. Tabler, 401 7 Ave., New York, Schine MOTEL, 963 James St. **$2,000,000.** Constr. Fall 1961. CD 9/9/59.

▲ **N. Y., Syracuse**—Syracuse University, University Pl., plans by King & King, 420 E. Genesee St., MEN'S DORMITORY and DINING HALL. **$3,000,000.** Bids Sept. 15, 1961.

▲ **O., Grove City**—Grove City Shopping Center Corp., c/o Lyman Brownfield, 50 W. Gay St., Columbus, SHOPPING CENTER, Harrisburg Pike and Southwest Blvd. **$1,500,000.**

▲ **Pa., Harrisburg**—Nationwide Development Corp., 234 N. High St., Columbus, O., MOTOR HOTEL, Front and Paxton Sts. **$1,500,000.**

▲ **S. C., Columbia**—American Mortgage & Development Co., 41 Broad St., Charleston, 400 RESIDENCES, Evergreen Park Subdivision. **$4,000,000.**

▲ **S. D., Fort Pierre**—KDMV Corp., Chas Drury, pres., c/o Scott-Peabody & Assoc., archts., 711-9th Ave. SE, Watertown, 21 arcre SHOPPING CENTER, BOWLING ALLEY, 29 unit MOTEL, SWIMMING POOL, parking for 1,740 cars, **$2,000,000.** Bids Fall.

▲ **Tenn., Knoxville**—W. A. Catlett, Newport Hy., Dandridge, plans by Guay & Associates, 168½ Blount Ave., 147 units, APARTMENT, Lyons View Drive, **$1,400,000.**

▲ **Tex., Houston**—Houston First Federal Savings & Loan Ass'n. and the **Westmont Corp.**, c/o Welton, Becker & Associates, archts.-engrs., 802 Lovett Blvd., 600,000 sq. ft. OFFICE and RETAIL STORES, Post Oak and Westheimer Rds., **$13,000,000.**

▲ **Tex., Dallas**—L & L Realty Corp., 211 N. Ervay St., 15 story, 119 unit masonry Terrace House APARTMENT, incl. underground garage covered with ice skating rink, swimming pool, Maple St., Cedar Springs Rd., Turtle Blvd. **$5,250,000.** Constr. 1961.

▲ **Wis., Beloit**—Fairbanks Whitney Corp., 745 5th Ave., New York, N. Y. plans by S. H. Morris, 173 W. Madison St., Chicago, Ill., SHOPPING and RECREATION CENTER, **$8,000,000.** Bids Fall 1961. CD 12/8/60.

▲ **Newfoundland, St. John's**—The Salvation Army, 20 Albert St., Toronto, Ont., Grace HOSPITAL RENOVATIONS and new NURSES' RESIDENCE, **$4,000,000.**

▲ **Ont., Galt**—South Waterloo Memorial Hospital plans by Allward & Gouinlock, 245 Davenport Rd., Toronto, HOSPITAL ADDN. **$1,575,000.** BA 9/61 or 10/61.

▲ **Ont., London**—D. Rubinoff, 1652 Stoneybrook Crescent N., plans by Philip Carter Johnson, 362 Queens Ave., four 12 story, APARTMENT TOWERS, SINGLE DWELLINGS and TERRACE HOUSING, AUDITORIUM, SWIMMING POOL, LIBRARY and STORES, Stoneybrook Village, North London, **$6,000,000.** CD 9/20/60.

INDUSTRIAL BUILDINGS

▲ **Ga., Savannah**—Southern Nitrogen Co., Inc., Hy. 21, PLANT ADDN. **$5,000,000.**

▲ **Ill., Batavia**—Celenese Plastics Co., Div. Celanese Corp. of America, 522 5th Ave., New York 36, N. Y., 90,000 sq. ft. PLASTIC CONTAINER MFG. PLANT, 17 acres Rte. 25, **$1,500,000.**

▲ **N. J., Holmdel**—Lily Tulip Paper Co., 122 East 42nd St., New York, N. Y., 1 story, 900,000 sq. ft. PLANT, Rte. 34 and New York Long Branch R.R. **$10,000,000.** Patchen, Mingledorff & Williams, 525 Telfair St., Augusta, Ga., consult. engrs. CD 10/6/60.

▲ **Va., Lynchburg**—Craddock-Terry Shoe Co., Carroll Rd., plans by Wiley & Wilson, 620 Court, SHOE FACTORY, Lynchburg Expressway. **$2,500,000.** CD 10/20/59.

▲ **Wash., Tacoma**—International Glass Industries, Ltd., Rust Bldg., 10,000 sq. ft. WINDOW GLASS PLANT, **$1.500,000.**

▲ **W. Va., New Martinsville**—Mobay Chemical Co. (Monsanto Chemical Co.) 1700 S 2nd St., St. Louis 4, Mo., and Farbenfabriken-Bayer AG West Germany, New Martinsville organic isocyanate chemical mfg. PLANT ADDN.

▲ **Alta., Whitecourt** — Alberta West Forest Products Corp. Ltd., 139-10021-100th St., Edmonton, 10,000 ton yearly NEWSPRINT MILL. **$30,000,000.** Johnson & Johnson, 111 W. Washington St., Chicago, Ill., U.S.A. and The H. K. Ferguson Co., 1783 E. 11th St., Cleveland, O., U.S.A., engr. CD 12/20/60.

▲ **Que., Fort Chimo**—Murray Mining Corp., Ltd., 200 Bay St., Toronto, Ont., ASBESTOS MINE, MILL, ROADS, DOCK, Ungava. **$36,000,000-$40,000,000.** Marshall, Nacklin, Monaghan Ltd., 1480 Don Mills Rd., Toronto, Ont., consult. engrs.

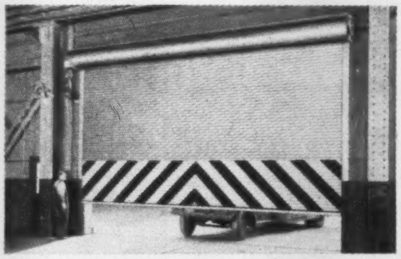
FOREIGN

▲ **Liberia, Monrovia**—Liberian National Electric Corp., Monrovia, three 10,000 kw unit HYDRO ELECTRIC PLANT, St. Paul River. **$22,000,000.**

For additional reports see CONSTRUCTION DAILY NEWSLETTER

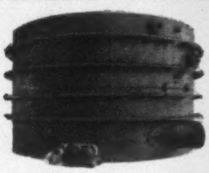
Kinnear Rolling Doors Are Registered

Kinnear's own fireproof vaults contain full information on every Kinnear door—including complete, detailed drawings. Parts for any door accidentally damaged can be supplied promptly. You are never saddled with an "orphaned" door. Your investment in space-saving, coiling-upward acting Kinnear Doors is protected far into the future.



The KINNEAR Manufacturing Co.
KINNEAR ROLLING DOORS
Saving Ways in Doorways
1820-40 Fields Avenue
Columbus 16, Ohio
1742 Yosemite Ave.
San Francisco 24, Calif.

POSEY
REFINERY VESSELS



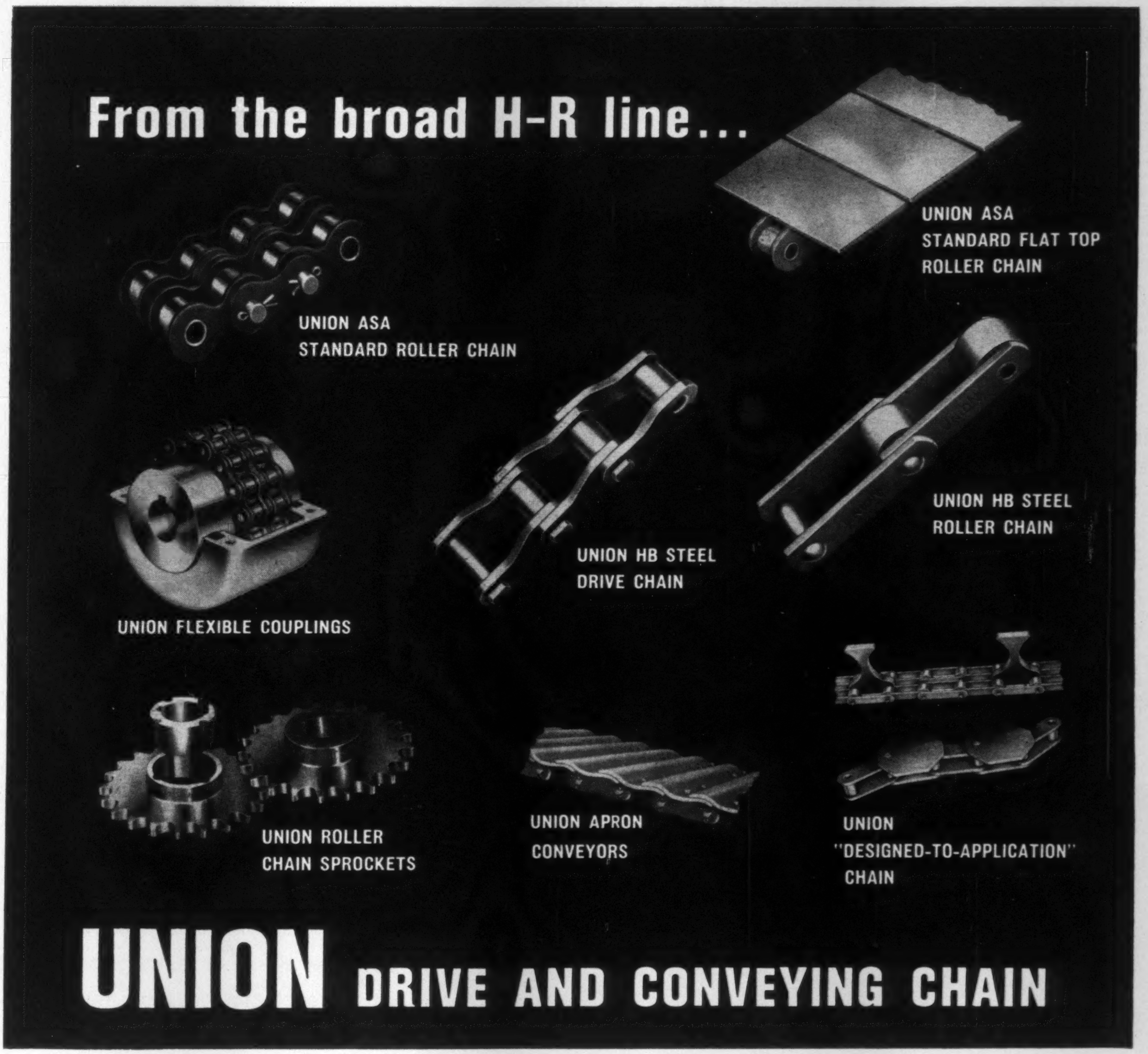
Fractionators, receivers, absorbers, scrubbers, refinery vessels of all types fabricated to your specifications.

For FREE 16-page illustrated catalog on heavy steel plate fabrications, write:

POSEY IRON WORKS INC
Custom Fabrication For Over 50 Years

DIVISIONS:
• Iroquois Asphalt Plants • Mixers and Blenders
• Tunnel Forms • Industrial Heating • Foundry
• Large OD Steel pipe

561 S. PRINCE STREET LANCASTER, PA.


From the broad H-R line...
UNION ASA STANDARD FLAT TOP ROLLER CHAIN
UNION ASA STANDARD ROLLER CHAIN
UNION HB STEEL ROLLER CHAIN
UNION HB STEEL DRIVE CHAIN
UNION FLEXIBLE COUPLINGS
UNION ROLLER CHAIN SPROCKETS
UNION APRON CONVEYORS
UNION "DESIGNED-TO-APPLICATION" CHAIN
UNION DRIVE AND CONVEYING CHAIN

Let your H-R power transmission specialist show you how to select the right chain to fit your power drive or materials conveying needs, at "off-the-shelf" savings.

Your H-R specialist is in the best position to give you an unbiased recommendation. He is backed by Union Chain, a division of Hewitt-Robins, with a *complete* line of chain, sprockets, and chain type flexible couplings. He has at his command a wealth of Hewitt-Robins experience in all phases of power drive and materials conveying applications.

Hewitt-Robins sales offices, warehouses, and stock-carrying distributors are conveniently located throughout the United States and Canada. To put an H-R specialist to work for *you,* give your nearest H-R sales office a call.

WRITE FOR H-R POWER TRANSMISSION BULLETINS • HEWITT-ROBINS DEPT. 8-60, STAMFORD, CONNECTICUT

UNION CHAIN: *roller chain,* **RT-60;** *engineering chain,* **A-4 . . . JONES MACHINERY:** *herringbone reducers,* **J-100;** *spiral bevel reducers,* **J-25;** *worm helical reducers,* **J-14;** *shaft mounted reducers,* **J-19;** *in-line helical reducers,* **J-18;** *gearmotors,* **J-17;** *power transmission components,* **J-10A, J-16, J-23;** *complete drive units,* **J-11, J-22.**

HR HEWITT-ROBINS

Conveyor Machinery and Belting • Power Transmission
Hose • Vibrating Equipment • Engineering Services

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS** — Commonwealth Mass., Dpt. P. Wks., 100 Nashua St., Boston, Bids opened 8/8, ROAD,

J. F. White Constr. Co., P.O. Box 358, Westwood, Mass., LB **$3,427,166**, est. $3,284,223, wid'n., reconstr. Rte. 128 incl. 14 bridges, Newton-Wellesley-Weston. CD 8/1/61.

▲ **MASSACHUSETTS**—Commonwealth Mass., Dept. P. Wks., 100 Nashua St., Boston, Bids opened 8/8, BRIDGE,

United States Steel Co., 1420 Statler Bldg., Boston, Mass., LB **$12,495,800**, est. $12,258,000, steel superstructure of bridge over Taunton River, 1-195-3(35)11, Fall River-Somerset. CD 7/7/61.

▲ **RHODE ISLAND**—State R. I. & Prov. Plants, Div. Purchase, State House, Providence, Bids opened Aug. 9, ROADS,

Aetna Bridge Co., 12 Stukely St., Providence, R. I., LB **$4,686,335**, est. $3,000,000, highway constrs. and bridges International Rte. 95, Bid No. 74, Cont. No. 6177, Federal Aid Proj. No. 1-95-3(13)37, Providence. CD 7/25/61.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **D. C., Wash.**—BA 8/30—D. C. Govt. Dpt. Sanitary Engineering, 499 Pennsylvania Ave. NW, Potomac Interceptor SEWER, Unit 8, Sugarland Segment, near Sterling, Va. CD 7/14/60.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 8/9, ROAD,

Poirier & McLane Corp., 33 West 42nd St., New York, N. Y., LB **$3,503,802**, (9 bidders), extend continuous constr. Bergen-Passaic Expressway (Interstate Rte. 80) westerly thru Lodi, Bergen Co. CD 7/6/61.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, ROADS,

Adam Eidemiller, Inc., R. D. 4, Greensburg, Pa., CA **$3,894,784**, 17,171 ft. divided hy. consisting reinforced pavement 24 ft. wide and 7 bridges, L. R. US 19, Butler Co., BA 7/20/61, CA 8/8/61. CD 7/25/61, under LB.

BUILDINGS—LB & CA

▲ **Waller Constr. Corp.**, 598 Madison Ave., New York, N. Y., CA 13 story air conditioned APARTMENT, 2 story GARAGE, 228 E. 44 St. NEW YORK, N. Y. Forty-Fourth leasing Corp., 565 5 Ave., New York 17, N. Y. Horace Ginsbern & Assocs., 205 E. 42 St., New York 17, N Y, archts. CD 12/22/60.

▲ **E. W. Bliss Co.**, 1382 Raff Rd. S.W., Canton, O., CA Est. **$4,000,000**, COLD REDUCING MILL, ALIQUIPPA, PA. Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh, Pa.

▲ **Westmoreland Constr. Co.**, Huff Ave., Greensburg, Pa., CA 1 story, 118,000 sq. ft. CONTAINER PLANT, New Stanton Interchange, YUKON, PA. International Paper Co., Container Div., 220 E. 42 St., New York 17, N. Y. E. George Cassis, 121 E. Union Ave., Litchfield, Ill., archt.

▲ **Uris Buildings Corp.**, 850 3rd Ave., New York, N. Y., CA Est. **$30,000,000**, 8 story, Washington Hilton HOTEL, underground garage, Connecticut Ave. and T St. N.W., WASH., D. C. Hilton Hotels Corp., 301 Park Ave., New York, N. Y., and Uris Building Corp., 850 3rd Ave., New York, N. Y. William B. Tabler, 401 7th Ave., New York, N. Y., archt.

SOUTH

BUILDINGS—BA

▲ **Va., Richmond**—BA 9/19—City of Richmond, City Hall, OFFICES for Department of Safety-Health-Welfare, Clay St. $3,750,000. Ballou & Justice, 300 West Franklin St., archts. CD 11/4/60.

HEAVY CONSTRUCTION—LB & CA

▲ **GEORGIA**—State Hy. Dpt., No. 2 Capitol Square, Atlanta, ROADS,

Ga.—**Hugh Steele, Inc.**, Box 398, Centre, Ala., CA **$215,853**, 6.9 mi. grading, base, surface treatment, one bridge on Pepperton to Worthville Rd., FAS Rte. 1567, Federal Aid Secondary Proj. No. S-1567(2) Butts Co., CA **$3,973,357**, 12.841 mi. grading, paving on Cordele to Perry Road, Interstate Rte. 75, Federal Aid Proj. No. I-75-1 (28) 126 Contract 1, Houston Co.;

Ga.—**MacDougald Constr. Co.**, 1625 Northside Drive, NW, Atlanta, Ga., CA **$5,627,756**, 5.936 mi. grading, paving on Atlanta, Ga. to Montgomery, Ala. road, Interstate Rte. 85, Federal Aid Proj. No. I-85-1 (12) 70 Contract 1, Fulton and Clayton Counties;

Ga.—**Tillett Brothers Constr. Co., Inc.**, Rte. 5, Shelbyville, Tenn., CA **$3,630,733**, 7.944 mi. grading, paving on Atlanta, Ga. to Chattanooga, Tenn. Road, Interstate Rte. 79, Federal Aid Proj. No. I-75-3 (10) 341, Contract 1, Whitfield Co.;

Ga.—**Ledbetter-Johnson Co. and Ledbetter Brothers, Inc.**, 401 E 1 Ave., Rome, Ga. CA **$1,157,987**, 9.878 mi. widening, reconstruction, resurfacing, 2 bridges on Fairmount to Cartersville Road, SR 61, US 411, Federal Aid Proj. No. F-018-1 (8), Bartow Co.;

Ga.—**General Contr. Co.**, P.O. Box 271, Vidalia, Ga., CA **$1,022,496**, 9.429 mi. grading, paving, two bridges on Douglas to Irwin County Line Road, Federal Aid Proj. No. F-105-1 (4), Coffee Co.;

Ga.—**R. T. Smith**, 2715 E. Ponce DeLeon Ave., Decatur, Ga., CA **$658,829**, 5.666 mi. grading, paving, two bridges on Forsyth to Gray Road, S. R. 18, Federal Aid Secondary Proj. NOS. S-0964 (5) and S-0964 (6) Monroe and Jones Counties;

Ga.—**Middle Georgia Paving & Constr. Co., Inc.**, Cochran, Ga., CA **$695,904**, 3.883 mi. grading, paving, on Centerville to Warner Robins Road FAS Rte. 1147 Federal Aid Secondary Proj. No. S-US-1147 (2) and State Aid Proj. No. S-US-1147 (2) and State Aid Proj. No. PR-2407(10), Houston Co.;

Ga.—**Sowega Contr. Co.**, Edison, Ga., CA **$295,751**, 8.272 mi. grading, base, surface treatment, one bridge on Cuthbert to Terrell County Line Road, FAS Rte. 1662, Federal Aid Secondary Proj. No. S-1662 (2) Randolph and Terrell Counties;

Ga.—**Coffee Constr. Co.**, P.O. Box 239, Eastman, Ga., CA **$196,689**, 7.552 mi. grading, base, surface treatment on Nicholls to West Green Road FAS Rte. 1730 Federal Aid Secondary Proj. No. S-1730 (1) Coffee Co.;

Ga.—**Hewitt Contrg. Co.**, 1509 3 Ave., Columbus, Ga., CA **$222,215**, 4.28 mi. grading, stabilized base, surface treatment on US 29 to SR 238 Road, FAS Rte. 2095, Federal Aid Secondary Proj. No. S-2095 (1) Troup Co.;

Ga.—**Knox-Rivers Constr. Co.**, Knox Bldg., Box 311, Thomson, Ga., CA **$338,813**, 2.589 mi. grading, paving, one bridge on Toomsboro to Milledgeville Road, SR 112, Federal Aid Secondary Proj. No. S-US-0686 (9) Baldwin Co.;

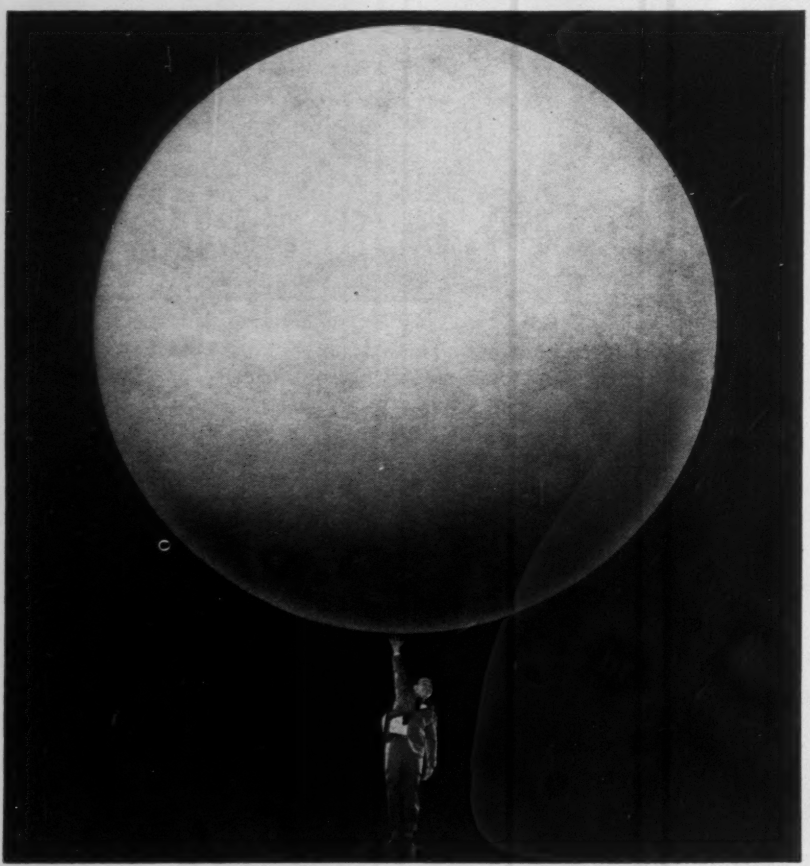
Ga.—**Hall Paving Co.**, Gainesville, Ga., CA **$108,330**, 21.82 mi. resurfacing on Commerce to Commer Road, SR 98, Georgia State Hy. Auth. Proj. No. RA-1-98 (1) Jackson and Madison Counties;

Ga.—**Ledbetter-Johnson Co.**, 401 E 1 Ave., Rome, Ga., CA **$432,899**, 5.736 mi. grading, paving on Lula Lake Road-FAS-Rte. 1293, Federal Aid Secondary Proj. No. S-1293 (1) Walker Co. Grand Total $18,577,612. BA 7/28/61. CA 7/28/61. CD 7/20/61.

BUILDINGS—LB & CA

▲ **Stone & Webster Engineering Corp.**, 49 Federal St., Boston, Mass., CA Total **$35,000,000**, PULP and PAPER PLANT ADDN., BRUNSWICK, GA. Brunswick

(Continued on page 104)

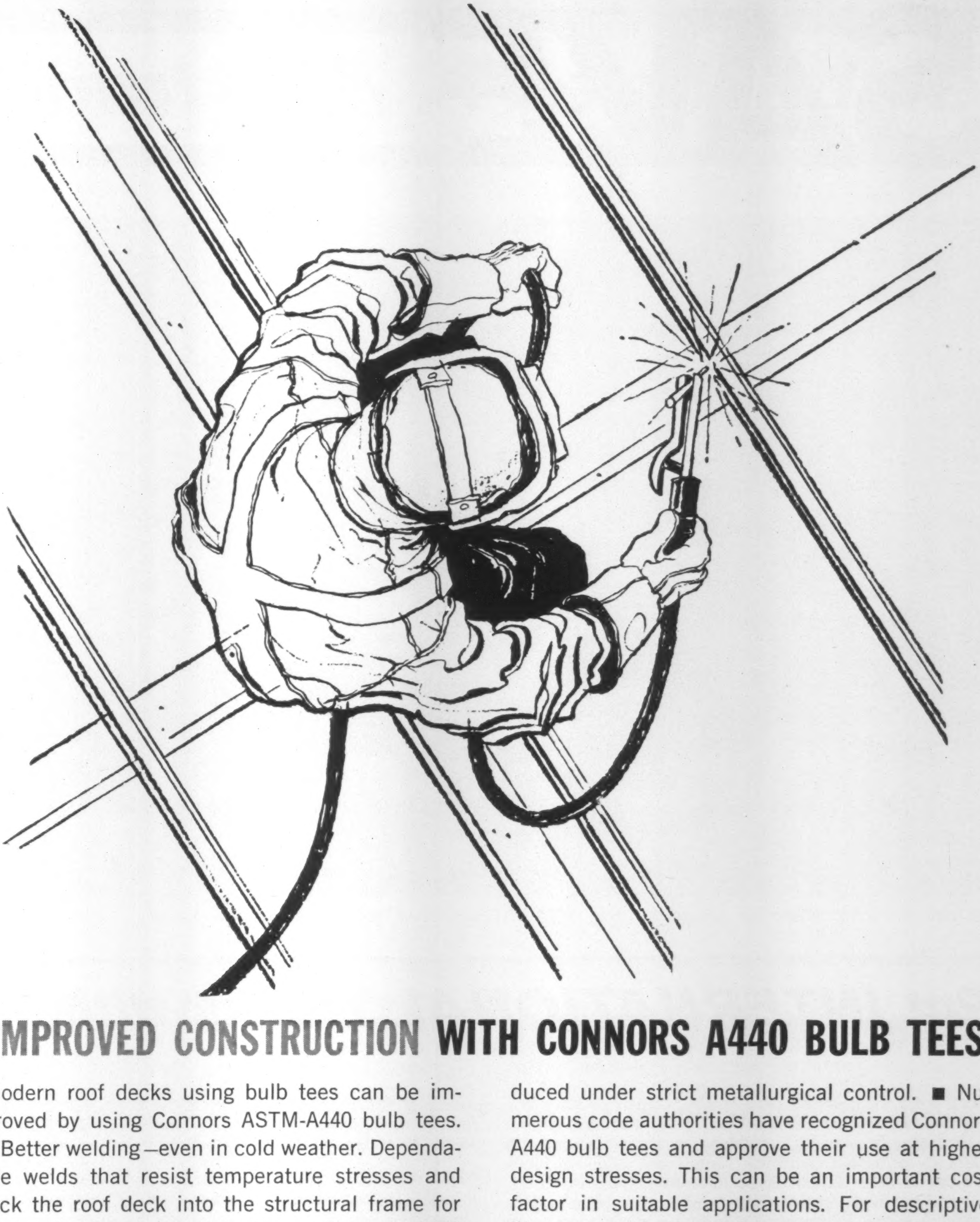


STRENGTH

With offices networking the nation and assets of over half a billion dollars, The Fund can assure that bulwark of security so necessary for your construction operations. The Fund's policies are geared to meet **all** your insurance needs, including Contract Bonds, Workmen's Compensation, Public Liability, Crime and Builder's Risk coverages. By servicing the **total** account, The Fund can often save you money, lower your bid and help you acquire new jobs. Ask your insurance agent or broker to insure you through **The Fund of Experience.**

CENTRAL BONDING OFFICES:
3333 CALIFORNIA STREET, SAN FRANCISCO
110 WILLIAM STREET, NEW YORK
Branch Offices in Principal Cities in America

The FUND Insurance Companies
FIREMAN'S FUND INSURANCE COMPANY
HOME FIRE & MARINE INSURANCE COMPANY
NATIONAL SURETY CORPORATION



IMPROVED CONSTRUCTION WITH CONNORS A440 BULB TEES

Modern roof decks using bulb tees can be improved by using Connors ASTM-A440 bulb tees. ■ Better welding—even in cold weather. Dependable welds that resist temperature stresses and lock the roof deck into the structural frame for higher load carrying capacity. ■ Connors A440 bulb tees cost no more than other tees and you get all the benefits of a specification steel produced under strict metallurgical control. ■ Numerous code authorities have recognized Connors A440 bulb tees and approve their use at higher design stresses. This can be an important cost factor in suitable applications. For descriptive literature or further information, write: Connors Steel Division, P. O. Box 118, Huntington, West Virginia; or phone JAckson 9-7171.

Steel

PORTER

CONNORS STEEL DIVISION
H.K. PORTER COMPANY, INC.

SAVE 1.The truck

You can't find a better team for savings than this INTERNATIONAL model VF-190, with rugged V-8 power and Select-O-Matic

Put INTERNATIONAL Trucks with

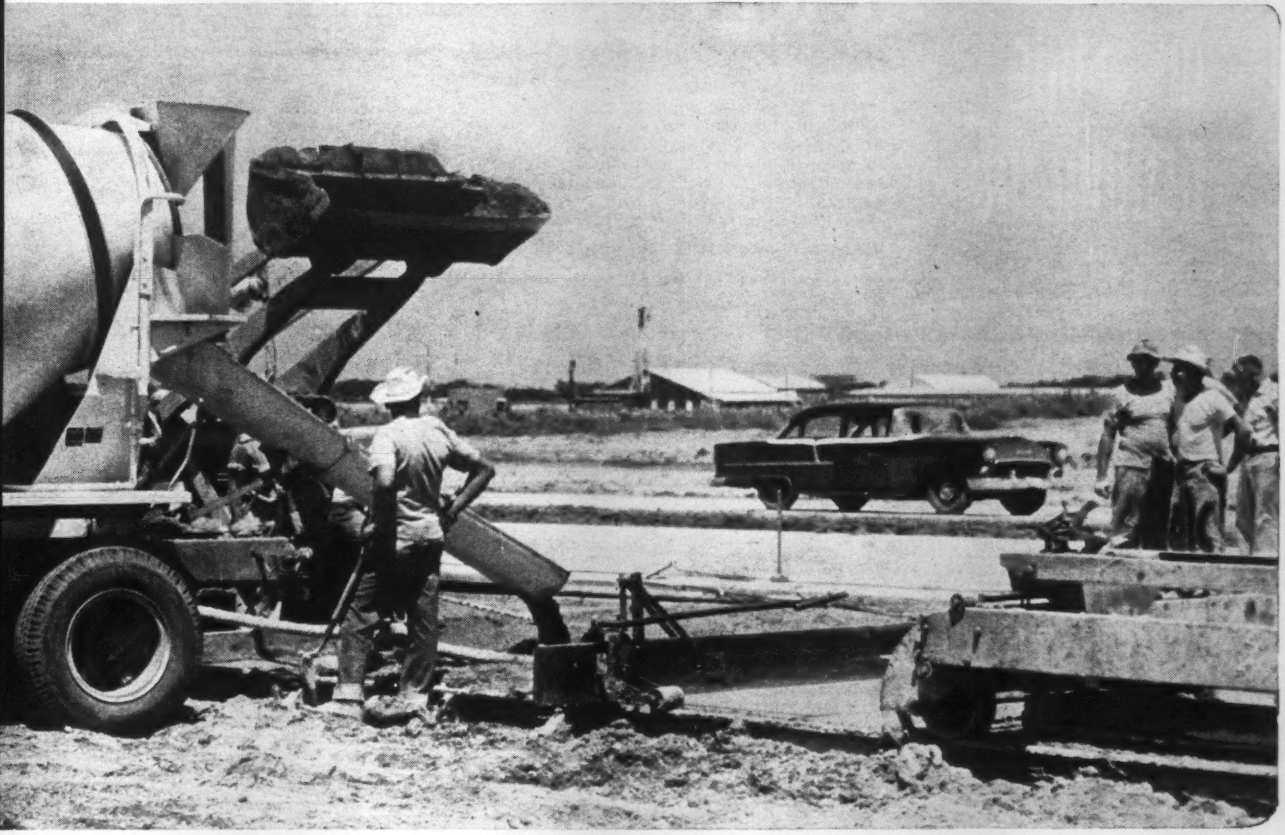
Save on truck wear and maintenance: Why is a Select-O-Matic transmission best? A coordinated combination of a five-speed synchromesh transmission with solenoid-controlled hydraulic clutch and high-efficiency torque converter, it can make definite savings in clutch, axle and engine operation. The dry clutch problem is eliminated, because hydraulically-operated clutch is always either *positively engaged* or *disengaged* by the solenoid, preventing drag. Most important of all, the torque converter cushions shock-loads and minimizes danger of tearing out the rear-end or axle.

Save on drivers: More positive control of INTERNATIONAL Select-O-Matic 5-speed synchromesh transmission cuts down on drivers "lost-time" reports. High-efficiency torque converter and solenoid-operated hydraulic clutch means controlled up-shifting or down-shifting, less wheel spinning. "Soft" starts become positive starts. Driving becomes less wearing, less "cowboy" and more nearly automatic. New drivers can be trained quickly and easily.

Save the schedule: Higher road speeds can be maintained with INTERNATIONAL Select-O-Matic transmissions. On grades, instead of the engine slowing down, the converter takes over to supply additional torque. Little speed is lost when shifting. Your drivers are given the pickup, the power and the gear selection to better *meet deadlines.*

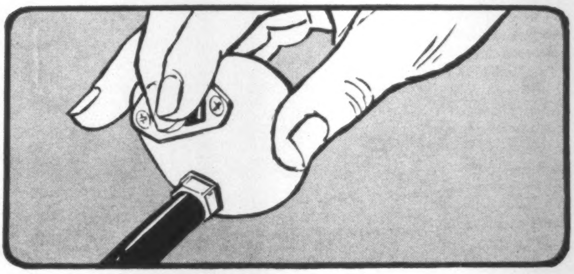
Everybody saves with proven INTERNATIONAL Select-O-Matic transmissions on their trucks—customers, owners, operators, drivers and maintenance men alike. Get the full story on performance-perfect Select-O-Matic transmissions from your INTERNATIONAL Truck Dealer or Branch. International Harvester Company, Chicago.

2. The driver 3. The schedule



transmission. This husky 33,000 lb. GVW rated 6-wheeler won't quit under any circumstances.

SELECT-O-MATIC transmissions on your payroll

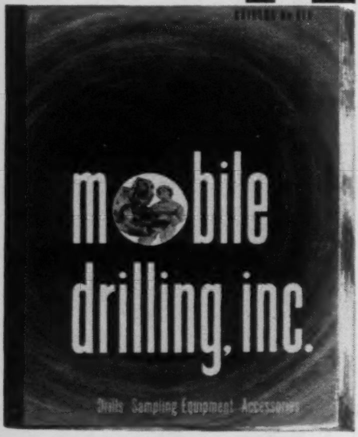


Press this "Magic Button" for savings

Solenoid-controlled clutching is so convenient and so effortless, it has become the talk of the truck stops. With less work and less fatigue, drivers are able to give full concentration to driving. They are better able to select and maintain the gear to meet the terrain. Much of the time and labor is taken out of the job.

INTERNATIONAL® TRUCKS WORLD'S MOST COMPLETE LINE IH®

here's the ANSWER *to your* DRILLING PROBLEMS



New MOBILE DRILL 80-Page Catalog No. 615

. . . lists more than 1900 items, including hydraulic-powered rotary drills, sampling tools and accessories. Equipment is designed specifically to help you speed up operations and **reduce costs** . . . both in subsurface exploration and in production drilling of soils, rock and concrete.

Use coupon . . . order your free copy today!

MOBILE DRILLING, INC., 960 N. Pennsylvania St., Indianapolis, Indiana

Please send me FREE COPY of NEW MOBILE DRILL CATALOG No. 615

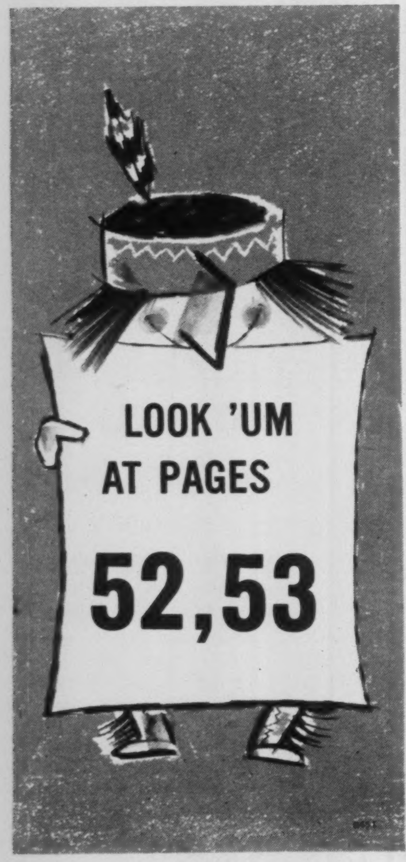
Name ....

MOBILE DRILL

Company ....

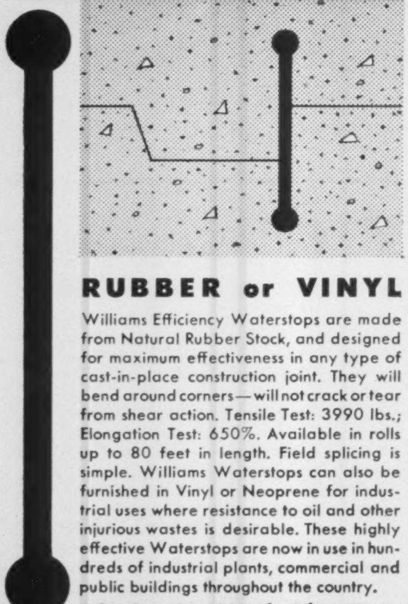
Address ....

City .... Zone .... State ....



WATERSTOPS

FOR MASONRY CONSTRUCTION JOINTS



RUBBER or VINYL

Williams Efficiency Waterstops are made from Natural Rubber Stock, and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners—will not crack or tear from shear action. Tensile Test: 3990 lbs.; Elongation Test: 650%. Available in rolls up to 80 feet in length. Field splicing is simple. Williams Waterstops can also be furnished in Vinyl or Neoprene for industrial uses where resistance to oil and other injurious wastes is desirable. These highly effective Waterstops are now in use in hundreds of industrial plants, commercial and public buildings throughout the country.

See Sweet's, or Write for Information.

WILLIAMS
EQUIPMENT and SUPPLY CO.
486 W. Eight Mile Rd. • Hazel Park, Mich.

(Continued from page 100)

Pulp & Paper Co., Southern Docks, Brunswick, Ga. CD 8/18/60.

▲ **Adler Built Industries, Inc.,** 1201 W 66th St., Hialeah, Fla., Owner Builds, **$7,500,000,** 600 RESIDENCES, vicinity 6800 block W. 14th Court, HIALEAH, FLA. Donald J. Reiff, 1185 71st St., Miami Beach, Fla., archt.

▲† **H. L. Coble Constr. Co.,** 1705 Battleground Ave., P.O. Box 3328, Greensboro, N. C., CA **$7,787,500,** 540 units CAPEHART HOUSING, U. S. Naval Station, NBy-(CH)-37375, Spec. 37375/61, MAYPORT, FLA. Dist P. Wks., Sixth Naval Dist., Bldg. 13, Charleston, S. C. BA 6/22/61. CD 6/27/61, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Mich., Pontiac**—BA 9/19—Twelve Town Drains, 4th Floor, Supers. Office Oakland County Bldg., 1 Lafayette St., Pontiac.

Proj. MS-1, 10,010 lin. ft. rein.-con. 13 ft. 3 in. DRAIN in tunnel, junction boxes, manholes, structures, Berkley, Madison Heights, Royal Oak, Huntington Woods, $3,401,700. Plans deposit $25. Hubbell Roth & Clark, Inc., 954 N. Hunter Blvd., Birmingham, Mich., engrs.

Proj. SS-1, 3,331 lin. ft. triple-box rein.-con. 14 ft. 3 in. x 13 ft. 3 in. DRAIN, 2,150 lin. ft. double box 14 ft. 3 in. x 13 ft. 3 in. DRAIN, sanitary interceptor reloc. junct. box, 11,400 sq. yd. conc. paving, 36 in. inlet, Hazel Park, Oak Park, Ferndale, Southfield, $3,274,428, Plans deposit $25, Pate & Hern, 532 Michigan Bldg., Detroit 26 Mich., engrs.

Proj. SS-4, 15,505 lin. ft. 10 ft. 6 in. to 18 in. rein.-con. DRAIN, tunnel, open cut, jct. boxes, manholes and connections, Hazel Park, Oak Park, Ferndale Southfield $3,459,603, Plans deposit $25. Pate & Hern, 532 Michigan Bldg., Detroit 26, Mich., engrs. CD 1/25/61.

▲ **Mich., Pontiac**—BA 9/22—Twelve Town Drains, 4th Fl., Bd. Supervs. Office Oakland County Bldg., 1 Lafayette St., Pontiac.

Proj. SS-2, 5,667 lin. ft. 14 ft. 3 in. x 13 ft. 3 in. rein.-con. double box DRAIN, 2,268 lin. ft. 6 ft. 0 in. rein.-con. pipe, open cut, conc. bedding, manholes, jct. boxes, inlets, cross-overs, Hazel Park, Oak Park, Ferndale, Southfield, $2,845,491, Plans deposit $25, Pate & Hern, 532 Michigan Bldg., Detroit 26, Mich., engrs.

Proj. SS-6, 17,402 lin. ft. 12 ft. 0 in. to 4 ft. 0 in. rein.-con. DRAIN, tunnel, rein.-con. pipe, manholes, structures, connections, Hazel Park, Oak Park, Ferndale, Southfield, $3,517,600, Plans deposit $25, Pate & Hern, 532 Michigan Bldg., Detroit 26, Mich., engrs. CD 1/25/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Alton & Southern Railroad,** 3105 Missouri Ave., East St. Louis, Ill., Owner Builds, **$5,000,000.** AUTOMATIC RAILROAD SWITCHING YARD, incl. hump to gravity-fed 32 classification tracks; electronic measuring devices, etc., vicinity east approach Douglas MacArthur Bridge, East St. Louis, ILLINOIS.

BUILDINGS—LB & CA

▲ **James McHugh Constr. Co.,** 6449 S. Park Ave., Chicago, Ill., CA **$3,530,000,** general contract HOSPITAL, Hektoen Institute, CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldg., Chicago, Ill. BA 7/18/61. CD 7/20/61, under LB.

Emmerson Comstock Co., Inc., 130 N. Wells St., Chicago 6, Ill., CA **$533,591,** electrical contract HOSPITAL, Hektoen Institute (Chicago, Ill.).

▲ **Foster Wheeler Corp.,** 666 Fifth Ave., New York, N. Y., CA design and construct COKING UNIT at Lockport Refinery, LOCKPORT, ILL. Texaco, Inc., 135 East 42nd St., New York, N. Y.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Frazier-Davis Constr. Co.,** 1319 Macklind Ave., St. Louis, Mo., LB **$6,193,685,** (10 bidders), 4,333 ft. long, 35 ft. diam. DIVERSION TUNNEL, Oroville Dam, Feather River Proj., Butte Co., CALIFORNIA. State Dpt. Water Resources, 1120 N St., Sacramento, Calif. BA 8/9. CD 7/6/61.

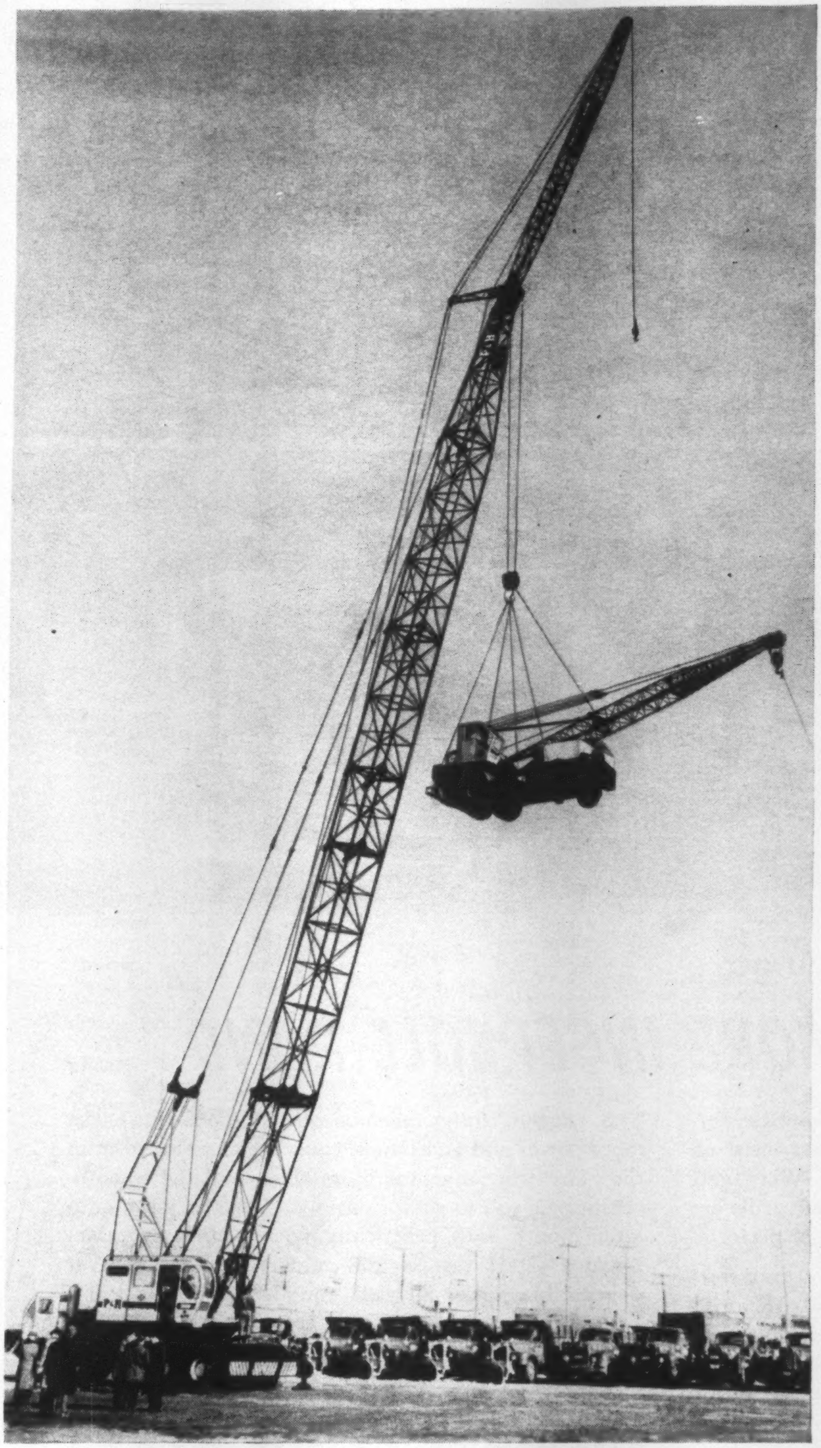
FOREIGN

▲ **Australia**—BA 2/5—Bus. Mgr. Snowy Mountains Hydro-electric Auth., P.O. Box 332, Cooma North, N.S.W., Contr. No. 20.065 MURRAY 1 PRESSURE PIPELINE consisting two steel pipe lines each approx. 5,300 ft. long and of largest diameter 13 ft. 9 in. together with distr. manifolds connecting pipe line to eight Francis turbines. The maximum design head is approx. 1,900 ft. Design and constr. of anchor blocks, piers and other ancillary works are included in the contract. Also incl. is supply and del. of approx. 900 ft. steel tunnel liner sections 13 ft. 9 in. in diameter, south-eastern part of State of New South Wales at approx. longitude 148° E. and latitude 36° S. The elevation of site varies between 2,000 and 4,000 ft. above sea level. Tender documents may be obtained on payment of $22.50 U.S. per set on application to Australian High Comr., Royal Bank Chambers, 100 Sparks St., Ottawa, Ont., Canada. Australian Consulate-General, 153 Kearney St., San Francisco, Calif., U.S.A. Australian Consulate-General, International Bldg., Rockefeller Centre, 636 Fifth Ave., New York, N. Y., U.S.A. Liaison Officer, Snowy Mountains Hydro-electric Auth., c/o U. S. Bureau of Reclamation, Federal Center, Denver, Colo., U.S.A.

For additional reports see CONSTRUCTION DAILY REPORTS SECTION

(Proposal Advertisements see pp. 115 to 118)

Giant truck crane can lift 90 tons ...lifts "little brother" for laughs



Nickel-moly steels give power train strength and toughness

Rolling on twelve huge tires and wielding a 250-foot boom, this bruiser can handle 90-ton loads with ease. Here you see it dangling its 31,000 pound "little brother" at a demonstration given by the manufacturer, Harnischfeger Corporation of Milwaukee.

At the planning stage, their engineers anticipated great operating stresses, designed critical power-train components around the properties of nickel-molybdenum alloy carburizing steels.

AISI 4820 (3½% nickel) is specified for the most heavily stressed transmission gears and auxiliary transmission gears. These components are carburized and hardened to handle the highest compressive loads, and at the same time develop high core strength and toughness to resist severe torsion and impact.

AISI 4620 (1.8% nickel) is used for a variety of gears, shafts, and pinions which encounter all but the most severe stresses.

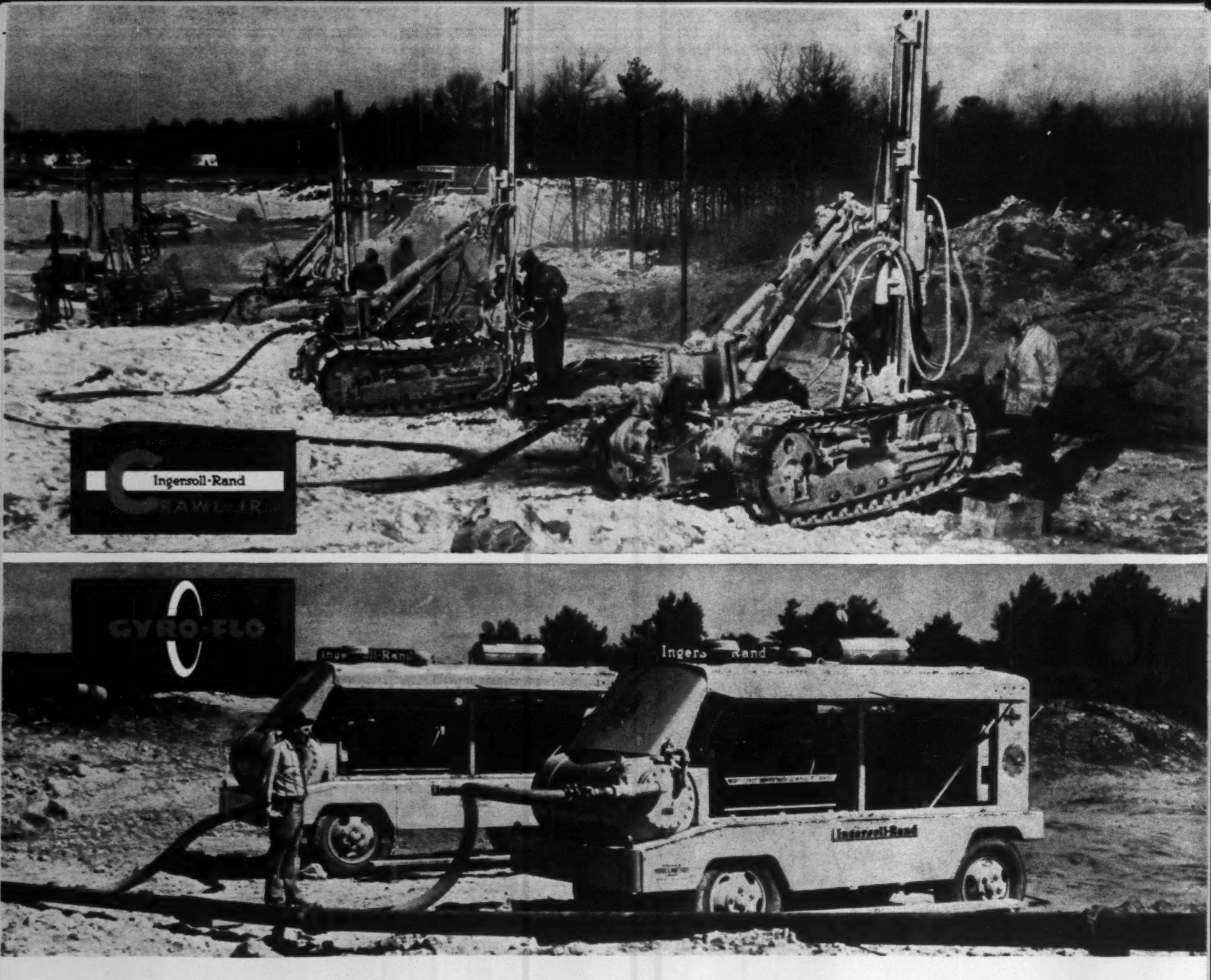
When you design, order, or build construction machinery, count on nickel-moly steels to deliver the specific combinations of properties that give heavy equipment built-in strength and toughness.

You'll find materials-engineering data on 11 types of heavy construction equipment in a new 76-page Inco booklet. For a free copy, request "A-265."

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street INCO New York 5, N. Y.

INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER



No matter where you go

YOU'LL SEE MORE INGERSOLL-RAND

Scenes like this are a familiar sight on rock jobs everywhere—because more and more contractors insist on the CRAWL-IR—Gyro-Flo combination. Word gets around that Gyro-Flo powered CRAWL-IR drills are consistently setting the highest standards of performance and economy.

On the job shown above, five CRAWL-IR drills powered by three 900-cfm Gyro-Flo portables are removing rock for a new Interstate Highway in Massachusetts. Excellent breakage is obtained with a 9′ x 7′ pattern for holes from 10′ to 25′ deep, and 9′ x 8′ for holes from 25′ to 40′ deep.

The rugged, *fully mechanized* CRAWL-IR packs more power and gives more coverage at a single setup than any other machine in its class. And the smooth-running Gyro-Flo compressors stay on the job month after month with practically no attention or maintenance—start fast in the coldest weather, deliver dependable power all year 'round.

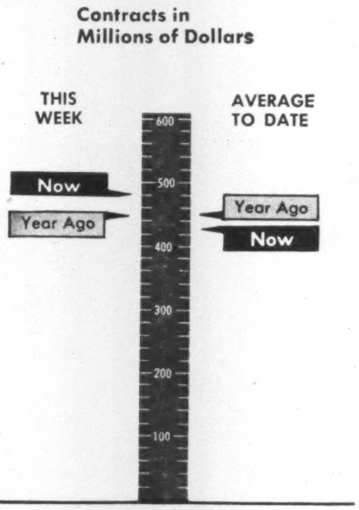
For further details on this cost-saving combination, see your I-R distributor or engineer.

Ingersoll-Rand
121A14 11 Broadway, New York 4, N.Y.

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

Construction Scoreboard

This Week...



AMOUNT OF CONTRACTS LET

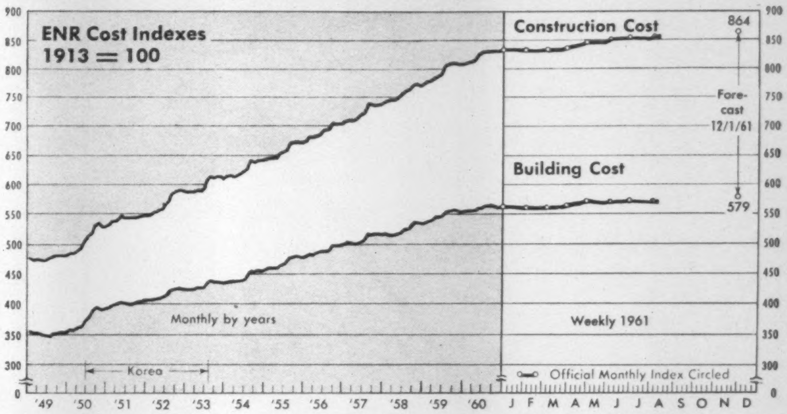
Contracts Awarded In 50 States By Type	This Week (millions)	Cum. 33 wks 1961 (millions)	Cum. 33 wks Chge '60-'61 %
All Heavy Construction	$479.0	$14,307.3	— 2
By Ownership			
PRIVATE	253.2	6,902.3	—10
PUBLIC	225.8	7,405.0	+ 8
State & Municipal	194.8	5,641.0	+ 7
Federal	31.0	1,764.0	+ 9
By Type of Work			
PUBLIC			
Waterworks	9.1	253.1	—18
Sewerage	13.8	463.5	+21
Bridges*	15.7	434.0	—19
Highways	85.3	2,459.5	+16
Earthwork, Dams & Waterways	11.9	551.8	+ 5
Buildings:			
Excl. Housing	54.4	1,750.5	+13
Housing	21.0	566.2	+28
Unclassified	14.6	926.8	— 8
PRIVATE			
Buildings:			
Mass Housing	130.8	3,112.0	—19
Commercial	38.3	1,698.8	+10
Industrial	70.8	1,805.7	+ 4
Unclassified	13.3	285.4	—50

* Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Aug. 10 (millions)	Cum. 32 wks 1961 (millions)	Cum. 32 wks Chge '60-'61 %
Corporate Securities	$ 63.9	$2.191.9	+17
State and Municipal:			
All Except Housing	124.8	4,233.1	— 3
Housing	0	92.9	—49
Federal Loans	0	183.7	+62
Federal Aid	0	2,990.6	+10
Total Nonfederal	$188.7	$9,692.2	+ 5
Federal Appropriations:			
Projects in U. S.	0	268.7	—80
Outside U. S.	0	2.3	—99
Total New Capital	$188.7	$9,963.1	— 7



ENR INDEXES (1913=100), 20-cities' average	Week of Aug. 17 1961	% Change from July 13 1961	% Change from Aug. 18 1960
Construction Cost	854.20	+0.1	+2.9
Building Cost	570.79	—0.1	+1.5

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850. 1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest month...

ENR COST INDEXES IN 22 CITIES, 1913=100

City	Construction Cost Aug. 1961	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Aug. 1961	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	647.77	−1.6	−0.3	503.58	−1.6	+1.0
Baltimore	755.91	0	+0.5	562.50	0	+0.6
Birmingham	679.81	0	+3.9	534.66	+0.3	+2.5
Boston	884.59*	+1.7	+6.4	593.83	0	+5.7
Chicago	947.28	−0.2	+3.4	594.72	−0.4	+0.5
Cincinnati	866.37	−0.06	+2.7	555.22	−1.2	+1.0
Cleveland	975.58	−0.06	+3.4	572.99	−0.09	+2.2
Dallas	660.32	+3.1	+3.3	531.05	+0.1	+1.8
Denver	776.87	−0.3	+2.6	558.18	+0.2	+1.0
Detroit	984.14	0	+2.2	614.41	0	+1.5
Kansas City	837.88	0	+2.4	561.98	0	+1.0
Los Angeles	942.03	0	+3.7	573.91	0	+1.8
Minneapolis	912.84	0	+2.5	586.65	0	+1.8
New Orleans	668.35	0	+4.2	515.34	0	+1.2
New York	1,077.58	−0.2	+3.6	669.92	−0.4	+3.0
Philadelphia	846.14	−0.3	+1.9	596.11	−0.4	+2.3
Pittsburgh	895.14	0	+1.1	628.12	0	+1.7
St. Louis	916.51	−0.4	+2.1	581.71	−0.6	+0.1
San Francisco	919.17	−0.2	+3.9	563.79	−0.4	+1.2
Seattle	887.25	0	+3.5	518.77	+0.7	+2.1
U. S.—20 Cities' avg.	854.09*	+0.05	+2.9	570.86*	−0.1	+1.7
Montreal	640.99	0	1.5	480.68	0	+3.1
Toronto	691.17	0	−0.9	493.30	0	−0.8

* Subject to adjustments due to retroactive increases.

CONTRACTS AWARDED	1961 July (millions)	1961 7-Mos. (millions)	Percent Change from 1960 July	Percent Change from 1960 7-Mos.
Total U. S. (ENR reported)	$1,883	$12,813	− 6	− 2
Private	718	6,198	−34	−11
Public	1,165	6,615	+26	+ 8
State and Municipal	842	4,994	+15	+ 7
Federal	323	1,621	+67	+ 9
ENR Volume Index, 1913=100	609	570	−11	− 3
NEW CONSTRUCTION CAPITAL				
Total U. S.	3,771	9,443	+79	− 9
State and Municipal Bond Sales	479	4,084	−12	− 4
Corporate Security Sales	217	2,116	−16	+ 8
Federal Loans, Aid (nonfederal work)	3,007	3,174	+10,346	+12
Federal Appropriations,* (federal work)	68	69	−95	−95

* Includes funds for outside U. S.

USS
COPPERSTEEL
UNITED STATES STEEL
14 GA

This mark tells you a product
is made of modern, dependable Steel.

Kinnickinnic River Project, under the direction of the Sewerage Commission of the City of Milwaukee.
General Contractor: The Druml Company, Inc.
Culvert Fabricator: Capital City Culvert Corporation, Madison, Wisconsin.

Steel culverts saved over $30,000 here

When this narrow river channel had to be widened and paved to prevent continual flooding, the contractors considered using electric pumps to keep the construction area drained. One look at the cost and they decided there must be a better way. There was. They bought 400 feet of corrugated galvanized steel drainage pipe made from USS Corrugated Culvert Sheets and saved over $30,000.

These steel culverts are 48" in diameter and can carry a million gallons of water an hour. They're strong, durable, corrosion-resistant and easy to install—it only took five men about eight hours to put them down. And when the channel was being paved, a crew merely rolled the whole culvert out of the way. After the job was finished, they removed the culverts to be used again.

For more information about galvanized culvert sheets for steel drainage pipe, send for our free booklet, "Culvert Sheets for Metal Drainage Products." Write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

United States Steel Corporation, Pittsburgh • Columbia-Geneva Steel, San Francisco • Tennessee Coal & Iron, Fairfield, Alabama United States Steel Supply, Steel Service Centers • United States Steel Export Company

United States Steel

TRADEMARK

Fluor Ranks Estimating as Big

The maxim, "It takes money to get money," gets unqualified support from top executives of Fluor Corp., Ltd., and their accounting records back them up.

For estimating—the basic ingredient in a construction company's money-making recipe—this Los Angeles-based engineering and construction corporation spends about $500,000 annually to get $100 million worth of contracts. Company outlays for preparing bids last year probably topped the average by a slight amount; it won $134 million worth of contracts (ENR July 20, p. 24).

Estimating ranks as big business. In Fluor's case it's a successful business. In the last five years, the company averaged about $100 million worth of new construction business a year, or 30 to 35% of all volume sought.

The company concedes, however, that the ratio of proposal-submissions to contracts obtained is higher today than in earlier, less competitive years. As recently as 1957, the company occasionally refused to bid a project if more than three other builders were competing for it.

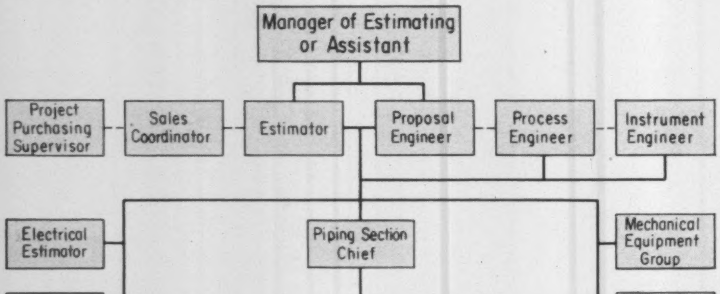
Receipt of an inquiry—usually through the sales-engineer force—starts proposal-wheels turning. Estimating time can vary. If a customer specifies a simple process plant, the estimating group can turn out preliminary design and lump-sum cost in 10 or 12 weeks. If the customer has a rough process scheme, but a familiar one, hydraulic and mechanical design comes off the boards in about six weeks. But normally, the estimating group turns out a definitive proposal in about eight weeks. Preliminary design of the proposed plant and its equipment needs, two weeks; obtaining price quotations on major equipment from venders, four weeks; analysis of the quotes, one week; completion of estimate with a precise figure, one week.

If the job is out of the country, Fluor may need an additional three to six weeks, depending on the project's location. In such cases, any one of three men will visit the site—William McKay, manager of estimating; M. L. Hosfelt, assistant estimating manager, or one of the senior estimators. (Mr. Hosfelt is also chief estimator at Fluor, Singmaster & Breyer, Inc., Fluor's engineering subsidiary in New York City.)

The on-location survey determines availability of labor and its productivity, living conditions, materials available locally and their prices, terrain, and other factors that may influence job costs.

The full responsibility of producing proposals falls on the 22-man estimating group. It does, however, use the broad range of skills and special talents possessed by Fluor—process engineering, purchasing and construction.

No single job gets the sole attention of the entire estimating department. Many are under way simultaneously, with a lead estimator and proposal engineer assigned to each. The latter is the liaison between Fluor and the customer. He interprets the client's specifications, making certain the proposal complies with them while adhering to good engineering practice. He also prepares the volume of design specifications that will accompany and define Fluor's proposal.



FLUOR PROPOSAL TEAM is a good-sized organization in itself.

A lead estimator will often handle more than one project at a time. During the first week he will spend full time on a single project, but at some point thereafter, the process engineers, the mechanical section or purchasing will be at work on the job. Between the first week and the final four to six weeks of a proposal's preparation, an estimator starts work on other projects. The last weeks of a proposal's preparation are a full-time operation for him.

A structural designer within the estimating group prepares sketches for all structural components. Although lacking the detail that would permit building a plant from them, these sketches provide an accurate means of defining costs. The estimating group also has its own personnel for preparing electrical and piping designs.

A process engineer assigned to a proposal at hand works the processes phase of the project. Estimators, however, work closely with him when only economics become involved.

There may be times when two or more choices present themselves, any one equally efficient. This leaves cost as the basic determinant; capital outlays and operating expenses must be weighed against each other. The answers to both will decide the route.

Significantly, it takes four out of Fluor's normal eight-week proposal timetable to get vender's quotations on equipment—the first step toward purchasing. This job falls to the company's purchasing department.

But to allow complete freedom of choice to contractors, Fluor says owners most frequently provide a list of acceptable venders and products. A brand name may be designated followed by "or of equal quality and performance."

Aware that the engineer-constructor has the widest range of contacts and extensive experience with a vast number of venders and their products, owners choose to leave the buying decision to the designer-builder, according to Mr. Hosfelt.

Sometimes, however, the lowest-cost item may be rejected by the customer. An oil company, for example, may carry a large inventory of parts for pumps of a specific manufacturer. If so, a switch to a different make, although less expensive initially, could be a higher-cost item in the long run. The brand backed by a large parts-inventory will then show as an "extra" in the proposal to the customer. The ultimate buying decision in this case remains with the owner.

Responsibility for evaluating the worth of new products and improvements to existing ones remains with Fluor's mechanical and equipment engineers.

Awareness of new engineering and business developments makes a top estimator. Few know more about their own company's operations, the competition and the general business of construction than the people in Fluor's estimating group. Estimators know what type of contract the company is after—lump-sum, cost-plus-percentage fee, or cost-plus-fixed fee.

This knowledge, however, does not affect the degree of sharpness on the pencil held by the estimator. "A good estimator is a consistant estimator; the best proposal at the lowest cost, no matter what type of contract is involved," says Mr. Hosfelt.

Management must decide the profit margin and it can do this only when the estimator's work is consistant. But at the management review the estimator sits with the 8 to 10 top executives who must make the final-price decision. The estimator details the competition, outlines experience on similar projects, defines the sharpness of equipment quotations, discusses labor productivity, rates, reviews alternate designs and expresses a degree of confidence in the estimate. From purchasing, management gets the outlook for the materials market—maybe up, maybe down—and makes a decision accordingly.

When the pay-off decision comes, it's back to the boards for the estimator, another proposal perhaps, or the constant job of preparing cost data from actual costs of contracts completed. Unit costs build sound estimates; they are history that saves time in the future, time that can't be wasted. Says Estimating Manager McKay, "Lost time to an estimator is like runway behind an airplane—you can't use it once its gone."

A losing proposal falls into the same category; the money expended on it can't be used again. It can be recouped, but in the long run all of industry pays.

All bids contain a fee, part of which reimburses a contractor for two types of expenditures; the cost of preparing the bid at hand, and some part of out-of-pocket expenses for recent proposals submitted on jobs lost to competing companies.

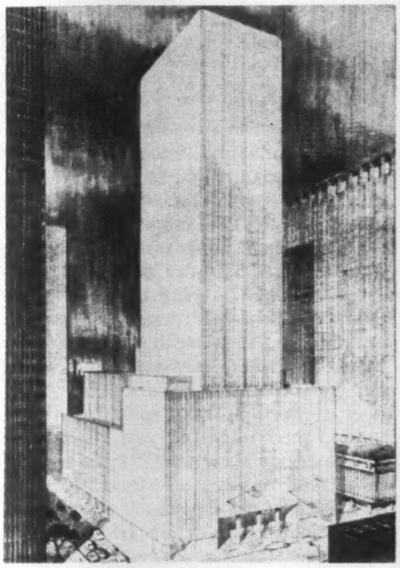
"Obviously, the process industry customer ultimately pays the bidding cost for engineering-construction work it awards," says Mr. McKay.

By holding bidding costs to a minimum, all business benefits, Mr. McKay says. He offers two suggestions to the buyers of construction that would help keep bidding costs at a minimum:

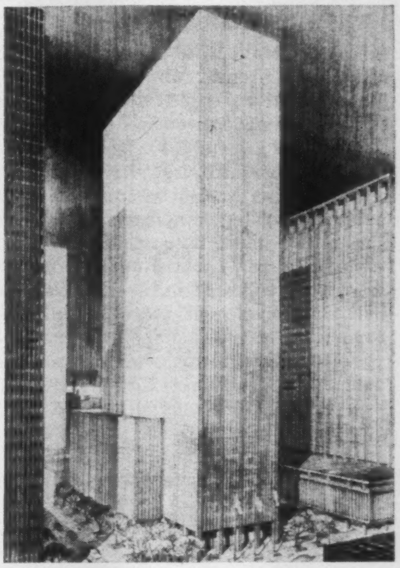
- Invite no more than three or four contractors to submit quotations on proposed work.
- Negotiate with the successful bidder any desired changes in work to be undertaken—after the award of the contract.

Mr. McKay adds, however, that contractors' bidding practices could stand improvement. As an example, he suggests that contractors decline to bid on projects when they know they cannot be competitive because they lack experience on the type of job involved. "And also consider geography." Don't bid against another contractor when the project is located in that contractor's own backyard," Mr. McKay adds.

Unsuccessful bids represent a substantial expenditure of man-hours with no salvage value. Mr. McKay says the waste of skilled, technical manpower "should be considered a waste of one of our essential national resources."



OLD ZONING allowed this design.



NEW ZONING will mean this.

New Zoning Widens City 'Canyons'

One of the first major buildings designed in conformance with New York City's new zoning ordinances will be started next year by Uris Buildings Corp. Cost estimates range between $40 million and $45 million.

Under current regulations, lower-floor walls can rise from lot lines; new regulations effective January 1, restrict building-bulk to lot size ratio, encouraging slim buildings set in surrounding plazas (see pictures).

In this case, Uris gets a space-bonus within the building equal to 10 times actual area of the plaza and three times the area of arcades—196,000 sq ft of additional interior floor area.

James Ruderman of New York City is the structural engineer, and Jaros Baum and Bolles, also of New York City, are the mechanical engineers. Shreve, Lamb & Harmon Associates are the architects.

The new building will be the third within a three-block area of Manhattan owned or partially owned by Uris. The others, both under way, are a $75-million hotel rising 45 stories and a $70-million, 42-story office building. They are located on Avenue of the Americas between 51st and 54th Streets.

Co-owners of the hotel with Uris are Rockefeller Center Inc. and Hilton Hotels Corp. The office building under way is owned equally by Uris and Rockefeller Center Inc.

FOUR MOTO-CRANES® WORK AT PLATTSBURG MISSILE BASE

HANDLE WITH CARE

A 75-ton Lorain Moto-Crane, MC-760 unloads a 50-ton pressure vessel used for missile fuel storage. It is 44 feet long and 12 feet in diameter. Like a huge thermos bottle, it must be handled with extreme care. Precise crane control and steady footing are required. 120 of these vessels, weighing from nine to fifty tons, must be placed in concrete housings.

Power-Set® outriggers major factor in speeding up crane work

A 75-ton Lorain Moto-Crane, MC-760, and three 45-ton Lorain Moto-Cranes, MC-545, all equipped with hydraulically operated Power-Set outriggers, scamper all over a 1600 square mile area around Plattsburg, New York, to service twelve Atlas F intercontinental missile launching complexes.

A joint venture by contractors Raymond-Kaiser-Macco-Puget Sound Bridge is using the four Lorains to unload and load and place extremely expensive and easily damaged pressure vessels, set steel forms, muck out, excavate, and pour concrete for the silos.

It is a 235-mile jaunt around the circuit to visit each of the sites so high speed mobility and fast set up time for lifts are important cost-saving factors.

"Manual outriggers unthinkable"

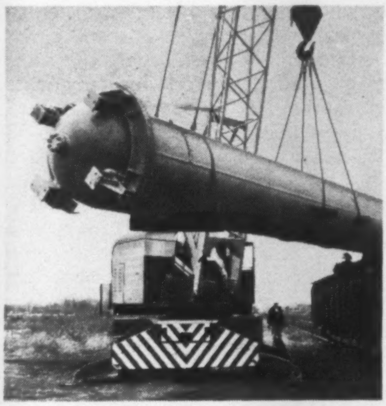
Leo Leifester, Equipment Superintendent says, "Traveling between 11 track sidings, the cranes must make good time on the highway to keep our demurrage charges down. As soon as a tank is delivered we load it on a truck to release the car. The Power-Set outriggers are an important factor here because production time makes setting outriggers manually virtually unthinkable. *They would take four times as long to set up.* The crane then follows the truck to the site and unloads it.

"The fast highway speed of the Lorains keeps travel time to a minimum. The MC-760 moves along at 35 mph to keep up with the truck, and it can negotiate the numerous hills without significant loss of speed. A crane may remain in one spot for three weeks, then might average 15 to 30 miles per day for the next three weeks.

"Any advantages in faster travel time, or quick set up time are translated into more efficient use of our costs."

Lorain Moto-Cranes, equipped with Power-Set outriggers and with many other operating advantages, can do a cost-cutting job for you too. Why not call your nearby Lorain distributor for all the facts—or ask for a demonstration to prove to yourself what Lorains can do. You'll be glad you did.

THE THEW SHOVEL COMPANY, LORAIN, OHIO



One of the three 45-ton Lorain Moto-Cranes, MC-545 stands rock steady on Power-Set outriggers to gently unload a 31-ton pressure vessel for nitrogen and oxygen storage.

LORAIN®

DOES MORE FASTER · FOR LESS

PLANTS in Lorain and Elyria, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawlers from $\frac{3}{8}$- to $2\frac{1}{2}$-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6,000-lb., 7,000-lb., and 9,000-lb. operating capacities.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

Building Trades Sign Missile Pact

Jurisdictional agreement with Martin Co. applies to Titan missile work at nine Air Force bases

A negotiated agreement between a missile manufacturer and the AFL-CIO's building and construction trades unions—the first of its kind—was cited last week as a significant new step in ending jurisdictional disputes on the nation's missile bases.

The pact, reached between the Martin Co. and 14 building trades unions, spells out in detail the areas of work to be handled in the installation and erection of missiles at nine Air Force bases where Martin Co. is integrating contractor for the Titan I and Titan II missiles. In the past, jurisdictional disputes between Martin employees, represented by the United Auto Workers, and the craft unions have caused serious work stoppages.

The agreement is designed to end the job assignment disputes by defining the exact assignments to be performed by Martin employees on the one hand and by building trades workers on the other.

In addition, it sets up a three-stage plan for mediating jurisdictional conflicts that might arise under the agreement.

Air Force Secretary Eugene M. Zuckert praised the plan which he said "will help eliminate difficulties associated with construction of ballistic missile facilities." Martin Co. President William B. Bergen described it as a "real step forward in assuring continuous operation at the various Titan sites and substantially eliminating the problems that have caused work stoppages in the past." For the Building Trades Department, President C. J. (Neil) Haggerty, who helped negotiate the pact with Martin Co. Vice President Douglas Dorman, said it "should result in a closer and more harmonious working relationship with the Martin Co. and our building and construction trade unions."

While the agreement spells out the Titan assignments to be handled by the craft unions, it specifically states that it does not define areas to be covered by the Davis Bacon law. This law provides for the payment of prevailing wages for federal construction work and is a key factor in the craft-industrial union contest for work assignments.

The joint pact spells out in extensive detail the work to be performed by Martin Co. employees, or its representative, and the craft union jobs to be handled by subcontractors who employ craft union workers.

As an example, the subcontractor and the craft workers will perform assignments of mechanical and electrical installation, including such specific tasks as propeller terminal electrical installation, hydraulic piping and air conditioning, battery power supply and motor generator work.

Either Martin Co., as integrating contractor, or its representative, will handle all work on and within the missile systems and sub-systems, including transporting and erecting the missile, fueling the missile, and repair and modification work either at the missile assembly building or on the site. This includes validation and checkout of the missile as well as testing equipment.

Should jurisdictional disputes occur over the assignments awarded in the agreement, the plan provides machinery to mediate such contests in order to avoid work stoppages. In the pact, the parties pledge there will be "no interruption" of work during the life of the agreement which runs "at least" until June, 1962.

Should a job conflict occur, the three-step machinery provides:

- The building trades employee will notify his union representative who will meet "on the spot" with a Martin Co. labor relations coordinator who will be stationed at each of the nine Titan missile sites.
- If they fail to settle the dispute, it will be turned over to the business agent of the union involved and the company's chief of industrial relations at the site, who will take up the dispute "in no event later than 24 hours after the matter is referred" to them.
- If this second step does not provide a solution, the dispute will be turned over to the general president of the union and Martin Co.'s corporate director of labor relations, Mr. Dorman.

The Martin-Building Trades agreement covers work on installation of the missile but does not involve construction work at the missile sites handled by general contractors.

The pact covers installation work at the following Air Force bases where the Titan missiles are being developed by Martin: Lowry, in Denver; Larson, Moses Lake, Wash.; Beale, Marysville, Calif.; Mountain Home, Idaho; Ellsworth, Rapid City, S. D.; McConnell, Witchita, Kan.; Davis-Monthan, Tucson, Ariz.; Little Rock, Ark.

Sub Clauses Are 'Protective'

The construction industry has a long history of restrictions negotiated by the building trades on the subcontracting of construction work. The restrictions appear in labor contracts and are commonly known as "subcontractor clauses."

Unlike the situation that exists with respect to industrial union clauses, few of the restrictions used by the construction unions are concerned with the preservation of job opportunities for members of the negotiating union. Most of the clauses are aimed at the protection of wages and working conditions.

These are the general conclusions of the U. S. Labor Department, based on a study of most of the major labor agreements in effect in 1959. In an earlier report (ENR, July 27, p. 70), the Department outlined the extent and general nature of union limitations on the subcontracting of construction and maintenance work. The present report covers restrictions on the subcontracting of "production processes" or what might be called the "major activity" of the negotiating union.

Only a very small number of the construction industry contracts forbid a contractor to subcontract without first obtaining union approval, according to the Labor Department. In most cases, the clauses require, instead, that the subcontractor comply with the terms of the prime employer's labor contract, or have a union agreement of his own, or use union labor or union-made materials. The latter are typical "hot-cargo" clauses.

Interest in these restrictive clauses has grown immensely since passage of the Landrum-Griffin law. As a result of that law, subcontractor clauses are becoming more common collective bargaining issues.

(Please turn the page)

Although the Landrum-Griffin law generally banned hot-cargo clauses, it exempted the construction industry from the ban. Under the law, contractors can agree to restrictions on subcontracting or can agree not to handle certain products, as long as the restrictions relate "to the contracting or subcontracting of work to be done at the site." Sponsors of the law, however, say the exemption does not apply to restrictions on the use of supplies, materials or products "transported to or delivered on the site."

In its review of restrictive clauses, the Labor Department found that those used in the 1959 construction industry labor contracts generally fell into one of three categories:

- Majority of the restrictions called for the subcontractor to comply with all the terms and conditions of the prime contractor's labor agreement. In some cases, the subcontractor was required to sign the prime employer's contract or a short form, or accept a subcontract clause subjecting him to the labor contract, or provide a written guarantee of compliance. In other cases, the prime labor agreement merely set standards below which wages, hours or working conditions for the subcontractor's employees could not fall.
- A second large group of contracts required the subcontractor to be under agreement with the same local union, with another local of the same international union, with a building trades' union or with an AFL-CIO affiliate.
- A third group of restrictions required subcontractors to employ union labor or use union-made materials, or both.

The Labor Department said only a small number of the agreements contained provisions for enforcing the restrictive clauses. Some of the construction industry contracts, however, did provide that violation of the subcontracting clause was sufficient cause for the cancellation or termination of the labor contract with the prime contractor.

Noncompliance was permitted by some of the construction agreements under certain circumstances. This occurred, for example, where the restriction violated state or federal law, or where it would work economic hardship on the prime contractor.

Labor in Brief . . .

- **Maintenance by contract**—The United Mine Workers' District 50 warns industrial maintenance workers that the building trades unions and the Construction Industry Joint Conference are out to destroy their jobs. Commenting editorially on CIJC's promotion of maintenance by contract, District 50 accuses the building trades of "sneaking around" in an attempt to raid industrial plants.

- **Local autonomy**—AFL-CIO President George Meany, speaking at the plumbers union convention last week, said local union autonomy must yield to international union decisions on matters of national importance or national defense. He cited no-strike pledges and the problem of discrimination as specific examples.

- **Jurisdictional compromise**—A jurisdictional dispute over cable laying at a Montana missile site is controlled, according to a federal mediator, by the Missile Sites Labor Commission's ruling on a similar dispute at Walker Air Force Base in New Mexico: Engineers should operate tractors used in either the plow-in or trench method, electricians the cable plow or cable reel and truck.

- **Safety class**—The carpenters union was one of the eight international unions whose members attended the second session of the Safety Training Institute for union officials sponsored by the AFL-CIO and the Labor Department's Bureau of Labor Standards. A special series of classes had to be held for the carpenters because so many attended the second course.

- **Strike drags on**—A six-week teamster strike that has stalled millions of dollars worth of construction in New York City eluded settlement again last week when striking ready-mix, sand and gravel drivers rejected a third employer offer. Pre-strike pay was $3.50 an hour, or $40.78 a day, including normal overtime and fringes.

- **Prevailing wages**—The Comptroller General has ruled that federally determined prevailing wages must be paid on construction of an access road that will eventually become part of the Texas state highway system. The fact that the road will be built on U.S. rights-of-way and will be used and maintained by the U.S. until completion of Amistad Dam, he said, makes the road temporarily federal public works.

OFFICIAL PROPOSALS

Bids: September 7, 1961

Sewerage Project Muhlenberg Township Authority, Berks County, Pa.

Sealed proposals for the work stated below will be received by Elmer Manwiller, Secretary, Muhlenberg Township Authority, at 2840 Kutztown Road, Hyde Park, Reading, Penna., until 2:00 P.M. Eastern Daylight Saving Time, September 7, 1961, and will there be publicly opened and read shortly thereafter. Proposals will be for furnishing all necessary labor, materials, and equipment, and performing all work of the Contract. Each proposal shall be accompanied by a certified check or bid bond in an amount not less than ten (10) percent of the bid total, all in accordance with the Contract Documents.

Copies of the Contract Documents, including Drawings and Specifications, will be on file (for inspection purposes only) at Muhlenberg Township Authority Building, 2840 Kutztown Road, Hyde Park, Reading, Penna. They may also be seen at the office of Gannett Fleming Corddry and Carpenter, Inc., Engineers, 600 North Second St., Harrisburg, Pa., from whom they may be obtained upon deposit of the following indicated amounts per set. Not more than two (2) sets will be permitted a prospective bidder. Checks shall be made payable to Gannett Fleming Corddry and Carpenter, Inc.

Contract One: COMPLETION OF CONSTRUCTION OF A SEWERAGE SYSTEM $70.00

(Part A) Consisting of all sewers and appurtenances to be completed and newly constructed to serve the areas known as Hyde Park, College Heights, and Wedgewood Heights.

(Part B) Consisting of all sewers and appurtenances to be completed and newly constructed to serve the areas known as Cherokee Ranch, South Temple, Hyde Crest, Muhlenberg Park, and a section of Riverview Park.

(Bidders will be permitted to submit bids for Part A or Part B as separate contracts, and also for Part A plus Part B as a combined contract; however, it will be mandatory for all bidders submitting a bid for Part A plus Part B as a combined contract to also submit bids for Part A and Part B as separate contracts. The right is reserved to award separate contracts for Part A and Part B, or for a combined contract consisting of Part A plus Part B, whichever may appear to be in the best interest of the MUHLENBERG TOWNSHIP AUTHORITY.)

Full refund will be made only to actual bidders for return of one (1) set, no more, of the Contract Documents (including Drawings and Specifications), in good condition within fifteen (15) calendar days after bid opening; refund for return of all other sets within the same period, whether taken out by bidders or non-bidders, will be fifty (50) percent of deposit. No refund will be made for Contract Documents returned later than fifteen (15) calendar days after bid opening.

MUHLENBERG TOWNSHIP AUTHORITY
Gannett Fleming Corddry and
Carpenter, Inc., Engineers

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5651) will be received at Weslaco, Texas, until 10 a.m., Central Standard Time, September 26, 1961, for furnishing labor and materials for Clearing, Earthwork, Concrete Lining and Structures for Rehabilitation of 6.0 Lateral System, Lateral Division, Texas, Lower Rio Grande Rehabilitation Project. Location near Harlingen, Texas, in Cameron County. Principal items are 142,300 cu. yds. constructing embankments; 4,260 cu. yds. concrete in lateral lining; 10,000 lin. ft. concrete pipe; and other work. Completion time 870 days. For particulars, address Bureau of Reclamation, P. O. Box 1609, Amarillo, Texas; P. O. Box 357, Weslaco, Texas; Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

OFFICIAL PROPOSALS

RATE: **The rate for Official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.**

CLOSING DATE: **Friday 10:30 A.M. for issue dated the following Thursday.**

SEND COPY TO: **Official Proposal Division,**
Engineering News-Record
Class. Adv. Div.,
P. O. Box 12, N. Y. 36, N. Y.

Bids: August 24, 1961

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Canal Law and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 24th day of August 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, F. J. FULLER, District Engineer, 353 Broadway, Albany, N. Y.						
Essex ((Rte. 9N)	RC 61-137	Westport-Elizabethtown, S.H. 1496	5.92	Asphalt Concrete	$19,000 Plans $5	$330,000
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee St., Utica 1, N. Y.						
Herkimer	TC 61-3	Herkimer Village: Caroline Street, S.H. 48-12 Herkimer Village: State Street, S.H. 48-11	0.95	Traffic Signals	$5,000 Plans $5	91,000
Herkimer	M 61-8	Days Spillway—Barge Canal—Approx. ¾ Mile East of Utica City Line	....	Rehabilitation of Race Behind Spillway Headgate	$2,700 Plans $5	53,000
DISTRICT No. 3, E. E. TOWLSON, District Engineer, 333 E. Washington St., Syracuse, N. Y.						
Onondaga (Int. Trg. Rte. 281)	FISH 61-17	Interstate Route Connection 571 (Jamesville-Dewitt) Syracuse-Fayetteville, S.H. 5587 Proj. EACI-281-2(49)	2.52 (2.35 Acc.)	Asphalt Conc.=3.46 Mi.; Misc. Work=1.41 Mi.; Hgs Comp. I-Beam, 3 Sps. 162.75′ Tot.; 2 Triple Reinf. Conc. Box Br. 55′ Sp. Ea.; Double Reinf. Conc. Box Br. 42′ Sp.	$150,000 Plans $5	2,650,000
Oswego (Rte. 126)	FARC 61-108	Mapleview-Checkered House, S.H. 9284 Proj. S-522(2)	0.97	Asphalt Concrete, Type 1A	$8,500 Plans $5	152,000
Oswego	FASS 61-9	Bethel Corners-Hannibal (County Road) Proj. S-2(2)	4.43	Asphalt Concrete	$34,000 Plans $5	632,000
Seneca (Rte. 96)	FARC 61-30	Waterloo Village (Fayette St.) (S.H. 1399; Waterloo Village, S.H. 1211; Waterloo Village, S.H. 1211A Proj. F-626(7)	0.47	Asphalt Concrete, Type 2A, I-Beam Bridge 73.5′ Sp. Widening 2 Prestressed Conc. Brs.; 3 Sps. 86′ Tot. 2 Sps. 100′ Tot.	$23,000 Plans $5	422,000
Tompkins (Rte. 96)	FARC 61-103	Trumansburg Village, S.H. 5206 Proj. F-128(4): F-494(3)	1.56 (0.09 Acc.)	Asphalt Concrete, Type 2A=1.61 Mi.; Misc. Work=0.04 Mi.; Repairs to Stone Arch Bridge 28′ Span	$30,000 Plans $5	566,000
Tompkins (Rte. 227)	FARC 61-123	Perry City-Trumansburg, S.H. 5575 Proj. F494(4)	0.58	Asphalt Concrete, Type 1A	$6,000 Plans $5	102,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Monroe	FATS 61-19	Rochester City: Inner Loop (FAC 60-7) (Front Street to North Street). (Proj. U-1089(15)	0.94	Traffic Signs	$3,800 Plans $5	69,000
Monroe	FASS 61-7	Mount Read Boulevard (County Road) Proj. S-587(1)	0.80 (0.47 Acc.)	Asphalt Concrete=1.23 Mi. Misc. Work=0.04 Mi.	$25,000 Plans $5	453,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, 65 Court Street, Buffalo, N. Y.						
Erie	FASCE 61-2	Scajaquada Creek Expressway (at Delaware Park) Proj. U-1087(5)	0.11	Pedestrian Overpass I-Beam 78′ Sp. Reinf. Conc. Ramps 524′	$9,000 Plans $5	169,000
Niagara (Int. Trg. Rte. 190 & Rte. 18D)	NIE 61-5 FINIE 61-4 FARC 61-129	Interstate Route 506, Niagara Expressway, Contract 5 (North Grand Island Bridge to Stephenson Ave.) Stephenson Ave. to Gill Creek) Porter Ave. Pt. 1, S.H. 1756 Porter Ave. Pt. 2, S.H. 1858 Proj. EACI-EACIG 190-1(43); S-606(2)	4.50 (5.29 Acc.)	9″ Cem. Conc. Pavt., 2 at 24′ Var.=4.02 Mi.; Asph. Conc.=0.43 Mi.; Misc. Work=0.05 Mi.; Access=1.53 Mi. Cem. Conc.; Pavt. & 3.76 Mi. Asph Conc.; 10 H.G.S. Comp. I-Beam, 3 Sps. 141.6′ Tot.; 4 Sps. 167.4′ Tot.; 3 Sps. 141.6′ Tot.; 4 Sps. 167.3′ Tot.; 3 Sps. 116.3′ Tot.; 3 Sps. 116.3′ Tot.; 3 Sps. 155.9′ Tot.; 3 Sps. 156.8′ Tot.; 3 Sps. 178.7′ Tot.; 3 Sps. 177.9′ Tot.; 2 H.G.S. Comp. Pl. Gird. Br., 3 Sps. 211.6′ Tot.; 3 Sps. 212.1′ Tot.; 2 RRGS Comp. I-Beam, 4 Sps. 229.5′ Tot.; 4 Sps. 229.5′ Tot.; 2 RRGS Comp. Pl. Gird., 7 Sps. 535.1′ Tot.; 7 Sps. 611.2′ Tot.	$570,000 Plans $10	10,374,000
Niagara	PSC 6607	Grade Crossing Elimination (Third Phase N.Y.C.R.R.; Erie R.R., Lehigh Valley R.R. Niagara Junction R.R.	....	Railroad Relocation; Miscellaneous R.R. Yard Work; 1—66′ Span R.R. Bridge (Steel Plate Girder) 1—Double Box R.C. Culvert; Miscellaneous Paving Work	$300,000 Plans $100 Large Size Only	5,515,000
DISTRICT No. 6, W. J. DENNIS, District Engineer, 30 W. Main Street, Hornell, N. Y.						
Steuben (Rte. 371)	RC 61-120	Cohocton-Naples, Pt. 1, S.H. 5611	2.64	Asphalt Concrete=2.48 Mi. Misc. Work=0.16 Mi.	$15,000 Plans $5	262,000
DISTRICT NO. 8, M. N. SINACORI, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Dutchess	FAC 61-12 FARC 61-96	City of Poughkeepsie: North-South Arterial Highway Delafield Street, S.H. 1762. Proj. U-322(21)	2.46	Demolition	$11,000 Plans $5	192,000
Orange (Rte. 94)	RC 61-134	Newburgh-Woodbury, S.H. 42	0.01	Removal of Boulder	$120 Plans $5	2,000
DISTRICT No. 9, J. C. FEDERICK, District Engineer, 71 Frederick St., Binghamton, N. Y.						
Broome (Int. Trg. Rte. 81)	FIC 61-14	Interstate Route 505: Five Mile Point to Broad Avenue (Binghamton State Hospital to Broad Avenue) Proj. I-81-1(13)	0.89	Demolition	$3,500 Plans $5	61,000
Delaware (Rte. 10)	FARC 61-133	Colchester-Delancey, S.H. 1272; Delancey-Delhi, S.H. 1441. Proj. F-845(4)	5.35	Asphalt Concrete	$65,000 Plans $5	1,199,000
DISTRICT No. 10, A. M. SARR, District Engineer, 325 W. Main St., Babylon, L. I., N. Y.						
Kings	FIBQE 61-1	Interstate Route Connection 512 Brooklyn-Queens Expressway, (Concord St. to Morgan Avenue) Contract 19. Proj. I-278-1(41)	3.30	Mall Barriers, Fencing, Landscaping, Misc. Work Rehabilitation of 2 Viaducts	$33,000 Plans $5	590,000
Nassau & Suffolk	FATS 61-20	Conduit Boulevard ,Part 5, S.H. 5701A; Sunrise Highway Extension, Part 1, S.H. 8474; Sunrise Highway Extension, Part 2, S.H. E-8438; Sunrise Highway Extension, Part 2A, S.H. 8470. Proj. U-947(22)	4.37	Traffic Signs and Delineators	$12,000 Plans $5	223,000
Suffolk	FARC 61-135	Sunrise Highway Extension, S.H. 59-13; Sunrise Highway Extension, S.H. 57-22; Bridgehamton-Devon, Part 2, S.H. 1524. Proj. F-559(14)	4.04	Roadside Improvement	$7,000 Plans $5	127,000
Suffolk	FASS 61-8	William Floyd Parkway Extension (C.R. 46A); (Sunrise Highway Extension to Moriches-Middle Island Manorville Road). Proj. S-531(3)	2.25	Asphalt Concrete=2.13 Mi. Misc. Work=0.12 Mi.	$46,000 Plans $5	830,000
Suffolk	FIIB 61-2	Fire Island Inlet Bridge Superstructure (Contract 2)	0.80	Reinf. Conc. Slab Pavt.=0.80 Mi. Including Superstructure for 27 Span Bridge 3 Steel Arch Sps., 2 at 233.3′, 1 at 600′, 22 Steel Gird. Sps. at 138′ Ea., 2 Steel Sps. at 45′ Ea.	$220,000 Plans $5	3,956,000

(Continued on the following page)

(Continued from preceding page)

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal Aid Highway Act. of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Department of Public Works" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bid deposit, the execution of the contract and bond shall conform to the provisions of the Highway Law, as set forth in the "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: September 19, 1961

Office of Purchasing Agents
City of Nashville, Tennessee
Project No. 8

Sealed bids will be received by the Purchasing Agent of the City of Nashville, Tennessee, at the office of the Purchasing Agent, until 10:00 A.M., Central Standard Time, on September 19, 1961, for Project No. 8—Heating Revisions and Additions, all in accordance with plans and specifications which are on file at the office of the Director of the Nashville Waterworks Department, City Hall, Nashville, Tennessee, and also at the office of The Chester Engineers, 601 Suismon Street, Pittsburgh 12, Pennsylvania. Immediately after closing time for receipt of bids, they will be publicly opened and read aloud in the office of the Purchasing Agent, City Hall.

The successful bidder will be required to furnish satisfactory Performance and Labor and Materialmen's Bonds.

Copies of the plans and specifications may be obtained by depositing Thirty-Five Dollars ($35.00) with the Engineers for each set of documents so obtained, the full amount of which will be refunded to each actual bidder, and Fifteen Dollars ($15.00) will be refunded to all others who return plans and specifications in good condition within ten (10) days after the opening of the bids. Equipment or material suppliers are not considered as actual bidders, and any plans taken out by such concerns will be eligible for a Fifteen Dollar ($15.00) refund per set of plans and specifications.

The right is reserved by the City of Nashville, through the Mayor, to reject any and all bids, to waive any informalities in the bids received, and to accept any bid which, in its opinion, may be for the best interest of the City.

A certified check or bank draft, payable to the City of Nashville, or a satisfactory bid bond executed by the bidder and a surety company, in an amount equal to Five Per Cent (5%) of the bid, shall be submitted with each bid.

No bid may be withdrawn for sixty (60) days after the scheduled closing time for the receipt of bids.

CITY OF NASHVILLE, TENNESSEE
E. B. SMITH
Purchasing Agent

Bids: September 19, 1961

Office of Purchasing Agent
City of Nashville, Tennessee
Project No. 11

Sealed bids will be received by the Purchasing Agent of the City of Nashville, Tennessee, at the office of the Purchasing Agent, until 10:00 A.M., Central Standard Time, on September 19, 1961, for Project No. 11—Improvements To Water Treatment Plant, General Construction, all in accordance with plans and specifications which are on file at the office of the Director of the Nashville Waterworks Department, City Hall, Nashville, Tennessee, and also at the office of The Chester Engineers, 601 Suismon Street, Pittsburgh 12, Pennsylvania. Immediately after closing time for receipt of bids, they will be publicly opened and read aloud in the office of the Purchasing Agent, City Hall.

The successful bidder will be required to furnish satisfactory Performance and Labor and Materialmen's Bonds.

Copies of the plans and specifications may be obtained by depositing One Hundred Dollars ($100.00) with the Engineers for each set of documents so obtained, the full amount of which will be refunded to each actual bidder, and Fifty Dollars ($50.00) will be refunded to all others who return plans and specifications in good condition within ten (10) days after the opening of the bids. Equipment or material suppliers are not considered as actual bidders, and any plans taken out by such concerns will be eligible for a Fifty Dollar ($50.00) refund per set of plans and specifications.

The right is reserved by the City of Nashville, through the Mayor, to reject any and all bids, to waive any informalities in the bids received, and to accept any bid which, in its opinion, may be for the best interest of the City.

A certified check or bank draft, payable to the City of Nashville, or a satisfactory bid bond executed by the bidder and a surety company, in an amount equal to Five Per Cent (5%) of the bid, shall be submitted with each bid.

No bid may be withdrawn for sixty (60) days after the scheduled closing time for the receipt of bids.

CITY OF NASHVILLE, TENNESSEE
E. B. SMITH,
Purchasing Agent

Bids · September 19, 1961

Office of Purchasing Agent
City of Nashville, Tennessee
Project No. 12

Sealed bids will be received by the Purchasing Agent of the City of Nashville, Tennessee, at the office of the Purchasing Agent, until 10:00 A.M., Central Standard Time, on September 19, 1961, for Project No. 12—George Reyer Pumping Station Additions, all in accordance with plans and specifications which are on file at the office of the Director of the Nashville Waterworks Department, City Hall, Nashville, Tennessee, and also at the office of The Chester Engineers, 601 Suismon Street, Pittsburgh 12, Pennsylvania. Immediately after closing time for receipt of bids, they will be publicly opened and read aloud in the office of the Purchasing Agent, City Hall.

The successful bidder will be required to furnish satisfactory Performance and Labor and Materialmen's Bonds.

Copies of the plans and specifications may be obtained by depositing Fifty Dollars ($50.00) with the Engineers for each set of documents so obtained, the full amount of which will be refunded to each actual bidder, and Twenty-Five Dollars ($25.00) will be refunded to all others who return plans and specifications in good condition within ten (10) days after the opening of the bids. Equipment or material suppliers are not considered as actual bidders, and any plans taken out by such concerns will be eligible for a Twenty-Five Dollar ($25.00) refund per set of plans and specifications.

The right is reserved by the City of Nashville, through the Mayor, to reject any and all bids, to waive any informalities in the bids received, and to accept any bid which, in its opinion, may be for the best interest of the City.

A certified check or bank draft, payable to the City of Nashville, or a satisfactory bid bond executed by the bidder and a surety company, in an amount equal to Five Per Cent (5%) of the bid, shall be submitted with each bid.

No bid may be withdrawn for sixty (60) days after the scheduled closing time for the receipt of bids.

CITY OF NASHVILLE, TENNESSEE
E. B. SMITH,
Purchasing Agent

Rev.
3/61

Bids: August 29, 1961

Cannonsville Bridge
Contract 464

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M. Eastern Daylight Saving Time on Tuesday, August 29, 1961, for Contract 464, for the construction of the Cannonsville Bridge across the Cannonsville Reservoir, including short portions of the adjoining highway approaches. The Cannonsville Bridge will be a two lane highway bridge with a superstructure supported by six piers and two abutments. The piers and abutments will be founded on cast-in-place concrete piles and will be constructed of reinforced concrete with certain portions faced with granite. The superstructure will have a total length of 1,200 feet between abutment bearings and will consist of seven spans of structural steel girders and a deck of reinforced concrete. The deck will have a roadway surfaced with asphalt concrete and a safety walk with steel railing at each side. There are included in this contract approximately 360 linear feet of adjoining highway work on the southerly side and approximately 400 linear feet on the northerly side of the Cannonsville Bridge. These highway approaches to the bridge will be paved with asphalt concrete. All work shall be as set forth in the specifications.

Pamphlets of the contract can be obtained in the Secretary's office, Room 1312, at the above address, upon application in person or by mail, by depositing the sum of $10.00 for each pamphlet. There will be a charge of $1.50 to cover mailing costs for each set of contract pamphlets requested. For further particulars apply at the office of the Chief Engineer at the above address.

ARTHUR C. FORD, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; MARTIN T. GERAGHTY, Chief Clerk.

CONTRACTORS
WATCH
THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS

Bids: See Advertisement

North Section
Twelve Towns Relief Drains
Oakland County, Michigan
Contracts NS-1 Through NS-7

Sealed proposals will be received by the DRAINAGE BOARD FOR THE TWELVE TOWNS RELIEF DRAINS, Oakland County, Michigan, at the Supervisor's Meeting Room, 4th Floor, Oakland County Office Building, 1 Lafayette Street, Pontiac, Michigan, for the construction of certain drains and structures, including the following approximate quantities.

Proposals will be received for the several Contracts up to 2:00 o'clock P.M., E.S.T., on the dates set forth herein.

PROPOSALS TO BE RECEIVED SEPTEMBER 19, 1961

CONTRACT NS-2

3564 lin. ft.	13'-0" Special Horseshoe—Open Cut
4852 lin. ft.	13'-0" Round—Tunnel
1621 lin. ft.	11'-0" Round—Open Cut
55 lin. ft.	11'-0" Round—Tunnel
16 lin. ft.	8'-0" Round—Open Cut

CONTRACT NS-5

948 lin. ft.	7'-6" Round—Open Cut
2030 lin. ft.	7'-0" Round—Open Cut
890 lin. ft.	6'-6" Round—Open Cut
1443 lin. ft.	6'-0" Round—Open Cut
491 lin. ft.	'60" Round—Open Cut
613 lin. ft.	42" Round—Open Cut
1458 lin. ft.	36" Round—Open Cut

CONTRACT NS-6

1987 lin. ft.	8'-0" Round—Open Cut or Tunnel
3855 lin. ft.	8'-0" Round—Open Cut
80 lin. ft.	8'-0" Round—Tunnel
2881 lin. ft.	7'-0" Round—Open Cut
1008 lin. ft.	6'-6" Round—Open Cut
2484 lin. ft.	6'-0" Round—Open Cut
70 lin. ft.	6'-0" Round—Tunnel
1382 lin. ft.	5'-6" Round—Open Cut

PROPOSALS TO BE RECEIVED SEPTEMBER 22, 1961

CONTRACT NS-4

2089 lin. ft.	12'-0" Round—Open Cut or Tunnel
3135 lin. ft.	11'-0" Round—Open Cut or Tunnel
150 lin. ft.	10'-6" Round—Tunnel

PROPOSALS TO BE RECEIVED SEPTEMBER 26, 1961

CONTRACT NS-3

4142 lin. ft.	7'-6" Round—Tunnel
2128 lin. ft.	7'-6" Round—Open Cut
1156 lin. ft.	7'-0" Round—Open Cut
140 lin. ft.	7'-0" Round—Tunnel
2227 lin. ft.	6'-0" Round—Open Cut or Tunnel
362 lin. ft.	6'-0" Round—Open Cut
1864 lin. ft.	5'-6" Round—Open Cut
1725 lin. ft.	60" Round—Open Cut
309 lin. ft.	60" Round—Tunnel
2295 lin. ft.	54" Round—Open Cut
75 lin. ft.	48" Round—Tunnel
672 lin. ft.	48" Round—Open Cut
75 lin. ft.	42" Round—Tunnel

CONTRACT NS-7

4238 lin. ft.	9'-0" Round—Tunnel

PROPOSALS TO BE RECEIVED SEPTEMBER 29, 1961

CONTRACT NS-1

5189 lin. ft.	15'-0" Special Horseshoe—Open Cut
5155 lin. ft.	10'-0" Special Horseshoe—Open Cut
111 lin. ft.	9'-0" Round—Tunnel
1036 lin. ft.	9'-0" Round—Open Cut
608 lin. ft.	8'-0" Round—Open Cut
745 lin. ft.	6'-0" Round—Open Cut
2003 lin. ft.	5'-6" Round—Open Cut
547 lin. ft.	60" Round—Open Cut
833 lin. ft.	54" Round—Open Cut
482 lin. ft.	42" Round—Open Cut

together with junction chambers, manholes, straight through structures, angle structures, drop structures, connections and other appurtenances.

All Bidders shall have prequalification rating by the Michigan State Highway Department for the appropriate dollar volume and classification of work bid, and shall submit evidence with his bid of this prequalification rating.

The drawings and specifications under which the work will be done are on file and may be examined at the office of the Board, 317 E. Eleven Mile Road, Royal Oak, Michigan, at the office of the Oakland County Drain Commission, 550 S. Telegraph Road, Pontiac, Michigan, and at the Detroit offices of Builders and Traders and Dodge Reports. Copies thereof may be obtained from the office of McNamee, Porter and Seeley, Consulting Engineers, Ann Arbor, Michigan, by making a deposit of $25.00 (checks only), for each set of contract documents divisions of the work to be bid each day on and one set of plans covering a division or which proposals are to be received. The full amount of the deposit will be refunded to the bidder for one set of documents and plans upon which a bona fide proposal has been submitted. For other sets of documents, $10.00 will be refunded for each set returned in good condition within 10 days after the bidding.

A certified check or bidder's bond for a sum not less than five per cent (5%) of the amount of the proposal will be required with each proposal.

The right is reserved by the Owner to accept any proposal, to reject any proposal and to waive irregularities in proposals.

Bids shall be firm for 30 days after the respective dates of opening, within which period of time the Drainage Board shall award contracts. Each Contract shall contain the following provision:

"This Contract is executed and delivered subject to the sale and delivery of the necessary bonds to complete the Twelve Towns Relief Drains. If such sale and delivery shall not be effected prior to March 1, 1962, then either party may terminate this Contract without liability."

DANIEL W. BARRY, CHAIRMAN
DRAINAGE BOARD FOR THE
TWELVE TOWNS RELIEF DRAINS
OAKLAND COUNTY, MICHIGAN

Bids: See Advertisement

Middle Section and Outlet Structure
Twelve Towns Relief Drains
Oakland County, Michigan
Divisions MS-1 Through MS-6, and OS-1

Sealed proposals will be received by the DRAINAGE BOARD FOR THE TWELVE TOWNS RELIEF DRAINS, Oakland County, Michigan, at the Supervisor's Room, Fourth Floor, Oakland County Office Building No. 1 Lafayette Street, Pontiac, Michigan, for the construction of certain drains and structures, including the following approximate quantities.

Proposals will be received for the several Divisions up to 2:00 o'clock P.M., E.S.T., on the dates set forth herein, at which time all bids will be publicly opened and read.

PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 19, 1961:

DIVISION MS-1

9,654 lin. ft.	13'-3" Tunnel Drain
200 lin. ft.	11'-0" Railroad Section Tunnel Drain
1 each	Regulator Chamber
3 each	Junction Boxes
8 each	Manholes

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 22, 1961:

DIVISION MS-2

3,369 lin. ft.	11'-0" Tunnel Drain
4,630 lin. ft.	9'-0" Tunnel Drain
1,993 lin. ft.	7'-6" Tunnel Drain
2 each	Junction Boxes
8 each	Manholes

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 22, 1961:

DIVISION MS-5

1,690 lin. ft.	9'-0" Open Cut Drain
2,130 lin. ft.	8'-6" Open Cut Drain
1,253 lin. ft.	8'-0" Open Cut Drain
2,710 lin. ft.	6'-0" Open Cut Drain
1 each	Junction Box
15 each	Manholes

PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 26, 1961:

DIVISION MS-3

11,726 lin. ft.	9'-6" Tunnel Drain
1 each	Junction Box
9 each	Manholes

DIVISION OS-1

1 each	Outlet Structure at Red Run

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 29, 1961:

DIVISION MS-4

1,990 lin. ft.	7'-0" Tunnel Drain
821 lin. ft.	5'-6" Tunnel Drain
767 lin. ft.	5'-0" Tunnel Drain
1,680 lin. ft.	42" Tunnel Drain
883 lin. ft.	7'-6" Open Cut Drain
3,170 lin. ft.	7'-0" Open Cut Drain
850 lin. ft.	4'-0" Open Cut Drain
1,150 lin. ft.	42" Open Cut Drain
912 lin. ft.	36" Open Cut Drain
1 each	Junction Box
22 each	Manholes

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 29, 1961:

DIVISION MS-6

1,215 lin. ft.	7'-0" Open Cut Drain
1,832 lin. ft.	6'-6" Open Cut Drain
1,697 lin. ft.	6'-0" Open Cut Drain
1,539 lin. ft.	5'-6" Open Cut Drain
950 lin. ft.	5'-0" Open Cut Drain
1,679 lin. ft.	4'-6" Open Cut Drain
496 lin. ft.	4'-0" Open Cut Drain
1 each	Junction Box
18 each	Manholes

All Bidders shall have pre-qualification rating by the Michigan State Highway Department for the appropriate dollar volume and classification of work bid, and shall submit evidence with their bids of this prequalification rating.

The drawings and specifications under which the work will be done are on file and may be examined at the Office of the Board at 317 East First Street (11 Mile Road), Royal Oak, Michigan; at the Office of the Oakland County Drain Commissioner at 550 South Telegraph Road, Pontiac, Michigan; and at the Detroit Offices of Builder's and Traders, and Dodge Reports. Copies thereof may be obtained from the Office of Hubbell, Roth & Clark, Inc., Consulting Engineers, 954 North Hunter Boulevard, Birmingham, Michigan, by making a deposit of Twenty-Five Dollars ($25.00) (CHECK ONLY), for each set of contract documents and set of plans covering a Division or Divisions of the work for each day on which proposals are to be received. The full amount of the deposit will be refunded to the bidder for one set of documents and plans upon which a bona fide proposal has been submitted. For other sets of documents, Ten Dollars ($10.00) will be refunded for each set returned in good condition within Ten (10) days after the bidding date.

A certified check or bidder's bond, for a sum not less than Five Per cent (5%) of the amount of the proposal, will be required with each proposal.

The right is reserved by the Owner to accept any proposal, to reject any proposal, and to waive irregularities in proposals.

DANIEL W. BARRY, CHAIRMAN
DRAINAGE BOARD FOR THE
TWELVE TOWNS RELIEF DRAINS
OAKLAND COUNTY, MICHIGAN

Bids: See Advertisement

South Section
Twelve Towns Relief Drains
Oakland County, Michigan
Contract SS-1 Through SS-8

Sealed proposals will be received by the DRAINAGE BOARD FOR THE TWELVE TOWNS RELIEF DRAINS, Oakland County, Michigan, at the Board of Supervisor's Room, 4th Floor, Court House Office Building, No. 1 Lafayette Street, Pontiac, Michigan, for the construction of certain drains and structures, including the following approximate quantities.

All Bidders shall have prequalification rating by the Michigan State Highway Department for the appropriate dollar volume and classification of work bid and shall submit evidence with their bids of this prequalification rating.

Proposals will be received for the several contracts up to 2:00 o'clock P.M. E.S.T. on the dates set forth herein.

PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 19, 1961:

CONTRACT SS-1

3,330	lin. ft. Reinforced Concrete Triple Box Drain (Each box 14'3"x13'3")
2,150	lin. ft. Reinforced Concrete Double Box Drain (Each box 14'3"x13'3")
192	lin. ft. 5'6" Sanitary Interceptor relocation.
1	Junction Chamber
11	Manholes
11,400	sq. yds. Bituminous Concrete Surfacing

CONTRACT SS-4

10,608	lin. ft. 10'6" Tunnel Drain
2,679	lin. ft. 9'6" Tunnel Drain
1,152	lin. ft. 7'0" Tunnel Drain
674	lin. ft. 2'0" Open Cut Drain
3	Junction Chambers
16	Manholes

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 22, 1961:

CONTRACT SS-2

5,674	lin. ft Reinforced Concrete Double Box Drain (Each box 14'3"x13'3")
2,268	lin. ft. 6'0" Open Cut Drain
2	Junction Chambers
12	Manholes

CONTRACT SS-6

2,576	lin. ft. 12'0" Tunnel Drain
2,023	lin. ft. 10'0" Tunnel Drain
2,997	lin. ft. 9'6" Tunnel Drain
8,450	lin. ft. 8'6" Tunnel Drain
635	lin. ft. 4'0" Tunnel Drain
721	lin. ft. 4'0" Open Cut Drain
2	Junction Chambers
24	Manholes

PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 26, 1961:

CONTRACT SS-3

3,608	lin. ft. Reinforced Concrete Double Box Drain (Each box 14'3"x13'3")
1,694	lin. ft. Reinforced Concrete Single Box Drain, 15'6"x13'3"
2,611	lin. ft. 7'0" Tunnel Drain
630	lin. ft. 3'0" Equivalent Tunnel Drain
760	lin. ft.10'6" Open Cut Drain
532	lin. ft. 11'6" Open Cut Drain
1,030	lin. ft. 4'6" Open Cut Drain

(Continued on following page)

OFFICIAL PROPOSALS

(Continued from preceding page)

1 Regulating Chamber
4 Junction Chambers
22 Manholes

PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 26, 1961:

CONTRACT SS-5
2,298 lin. ft. 9'0" Tunnel Drain
176 lin. ft. 7'6" Tunnel Drain
1,097 lin. ft. 5'6" Tunnel Drain
1,352 lin. ft. 4'6" Tunnel Drain
577 lin. ft. 9'6" Open Cut Drain
1,100 lin. ft. 8'6" Open Cut Drain
2,485 lin. ft. 7'6" Open Cut Drain
1,501 lin. ft. 6'6" Open Cut Drain
838 lin. ft. 6'0" Open Cut Drain
891 lin. ft. 5'6" Open Cut Drain
1,907 lin. ft. 5'0" Open Cut Drain
4 Junction Chambers
27 Manholes

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 29, 1961:

CONTRACT SS-7
538 lin. ft. 8'6" Open Cut Drain
1,473 lin. ft. 8'0" Open Cut Drain
2,668 lin. ft. 7'6" Open Cut Drain
1,000 lin. ft. 7'0" Open Cut Drain
874 lin. ft. 6'6" Open Cut Drain
2 Junction Chambers
10 Manholes

CONTRACT SS-8
2,268 lin. ft. 11'6" Tunnel Drain
1,862 lin. ft. 9'0" Tunnel Drain
2,325 lin. ft. 9'6" Open Cut Drain
1,812 lin. ft. 7'0" Open Cut Drain
1,097 lin. ft. 6'0" Open Cut Drain
2,595 lin. ft. 4'6" Open Cut Drain
168 lin. ft. 5'0" Open Cut Drain
599 lin. ft. 8'0" Open Cut Drain
514 lin. ft. 2'6" Open Cut Drain
2 Junction Chambers
14 Manholes

The drawings and specifications under which the work will be done are on file and may be examined at the office of the Board at 317 E. 11 Mile Road, Royal Oak; at the Office of the Oakland County Drain Commissioner at 550 South Telegraph Road, Pontiac; and at the Detroit Offices of Builders' and Traders' and Dodge Reports. Copies thereof may be obtained from the office of Pate and Hirn, Inc., Consulting Engineers, 532 Michigan Building, Detroit 26, Michigan, by making a deposit of Twenty Five Dollars ($25.00), (Check only), for each set of contract documents and set of plans covering a Contract or Contracts of the work for each day on which proposals are to be received. The full amount of the deposit will be refunded to the bidder for one set of documents and plans upon which a bona fide proposal has been submitted. For other sets of documents Ten Dollars ($10.00) will be refunded for each set returned in good condition within ten (10) days after the bidding date.

A certified check or bidder's bond for a sum not less than five per cent (5%) of the amount of the proposal will be required with each proposal.

The right is reserved by the Owner to accept any proposal, to reject any proposal and to waive irregularities in proposals.

Bids shall be firm for 30 days after the respective dates of opening, within which period of time the Drainage Board shall award contracts. Each contract shall contain the following provision:

This contract is executed and delivered subject to the sale and delivery of the necessary bonds to complete the Twelve Towns Relief Drains. If such sale and delivery shall not be affected prior to March 1, 1961, then either party may terminate this contract without liability.

DANIEL W. BARRY, CHAIRMAN
DRAINAGE BOARD FOR THE
TWELVE TOWNS RELIEF DRAINS
OAKLAND COUNTY, MICHIGAN

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5650) will be received at Placerville, California, until 9 a.m., Pacific Standard Time, (10 a.m., Pacific Daylight Savings Time), September 21, 1961, for furnishing labor and materials for Earthwork, Pipelines, Structures and Reservoirs, El Dorado Main and Laterals 2.ON, 3.2N, 3.2S, 5.4N, 8.0S, 8.0S-0.8N and 8.0S-2.1N, American River Division, Central Valley Project, California. Location near Placerville, California in El Dorado, California. Principal items are 129,000 cu. yds. excavation; 69,000 lin. ft. furnishing and laying pressure pipe; 65,000 pounds steel pipe and fittings for structures; and other work. Completion time 400 days. For particulars, address Bureau of Reclamation, P. O. Box 2511, Sacramento, California; P. O. Box 707, Placerville, California; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

OFFICIAL PROPOSALS

Bids: August 31, 1961

The Port of New York Authority
Brooklyn-Port Authority Piers

EXISTING PIERS 16 & 17
BORINGS
CONTRACT BP-507.320

Sealed proposals for making borings and taking samples at Piers 16 and 17 at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Thursday, August 31, 1961 at which time said proposals will be opened and read in Room No. 1108.

Contract documents may be seen at the office of the Assistant Chief Engineer for Design of the Authority, Room 1115, and copies will be furnished upon request. No deposit will be required but the documents shall be returned in good condition not later than forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman
New York, August 17, 1961.

District of Columbia—Sewer & Tunnel Construction—Dept. of Sanitary Engineering, D. C., Office of the Potomac Interceptor, July 27, 1961. UNIT #4, THE FAIRFAX-LOUDOUN TUNNEL OF THE POTOMAC INTERCEPTOR SEWER, LOCATED NEAR THE POTOMAC RIVER AT THE FAIRFAX-LOUDOUN COUNTY LINE, VIRGINIA, Invitation No. C-624-S (Contract No. 18960), consisting of the following: TUNNEL CONSTRUCTION: 4,900 lin. ft. 72" i.d. concrete lined or concrete pipe in tunnel, including air and access shafts. OPEN CUT CONSTRUCTION: 800 lin. ft. 72" i.d. concrete sewer pipe installed in trench. ACCESS ROAD: 2,885 lin. ft. of graded gravel permanent access road. (Wage rates have been predetermined by Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D.C. Treasurer. (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EDT, August 23, 1961, in Room 424, 499 Penn. Ave., N.W.

Bids: September 6, 1961*

New York City Housing Authority

ADVERTISEMENT FOR BIDS
JONATHAN WILLIAMS HOUSES
PROJECT NO. NYS-101

Sealed proposals will be received by the New York City Housing Authority, 299 Broadway, New York 7, N. Y., until 2:30 P.M. (E.D.T.), Wednesday, September 6, 1961,* at which time said proposals will be opened and read in Room 312, for:

1. Foundations and General Construction
2. Heating and Ventilating
3. Electric Work
4. Plumbing
5. Elevators

For Jonathan Williams Houses (Project No. NYS-101), located in the area bounded generally by Marcy Ave., Division Ave., Roebling St., and Broadway, in the Borough of Brooklyn, New York City.

A more complete description of the work and full information for bidders is contained in the Contract Documents. A deposit of $75 is required for documents for Nos. 1-4; reimbursement of $74 will be made upon their safe return. A deposit of $25 is required for documents for No. 5; reimbursement of $24 will be made for their safe return. Deposit may be made by cash or check payable to the Authority, at the cashier's office, 12th floor, 299 Broadway, and the documents obtained at 297A Broadway upon presentation of the cashier's receipt.

If the proposal is duly submitted by any person or corporation making the deposit required, the full amount of such deposit for one set will be returned to such person or corporation, provided that the set is returned in good condition within thirty (30) days following the award of the contract or the rejection of the proposal of such person or corporation. Upon return of any other sets in good condition within such period whether by a person or corporation duly submitting a proposal or by some other person or corporation, reimbursement will be made to the extent specified for each such set returned.

The Authority reserves the right to waive any informalities in the bids received, to reject any or all bids, and to award the contract only to those who, in accordance with the regulations and judgment of the Authority, are fully experienced in this type of work and have an adequate financial status. No prequalification is required for the above contracts.

NEW YORK CITY
HOUSING AUTHORITY
William Reid, Chairman

*The Authority reserves the right to postpone the bid date.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5645) will be received at Norton, Kansas, until 10 a.m., Central Standard Time, September 19, 1961, for furnishing labor and materials for Earthwork, structures, and track relocation of Chicago, Rock Island and Pacific Railroad and connections to Chicago, Burlington and Quincy Railroad, Norton Dam, Missouri River Basin Project, Kansas. Location Norton, Kansas. Principal items are 2,539,300 cu. yds. of excavation; 5,315 cu. yds. of concrete; laying 10.5 miles of track; furnishing and erecting 2,150,000 lbs. of structural steel; 27,000 tons of ballasting; placing 53,000 tons of subballast; and other work. Completion time 630 days. For particulars, address Bureau of Reclamation, Building 46, Denver Federal Center, Denver 25, Colorado; Post Office Box 510, Norton, Kansas; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Many contractors depend entirely upon the

OFFICIAL PROPOSAL COLUMNS

of

Engineering News-Record

for Opportunities to bid. They might not see your announcements if printed elsewhere.

You undoubtedly want their bids on your contracts. Make sure of them on your next contract.

The cost is only $2.70 a line per issue.

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE

The advertising rate is $45.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

AUGUST 24TH
ISSUE
CLOSES
AUGUST 14TH

UNDISPLAYED RATE

$2.70 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take 1/2 of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36

SALES ENGINEERS
PROCESS ENGINEERS

Opportunities for both Sales and Process Engineers with medium size engineering-construction company which designs and builds equipment and entire plants for the chemical process industry. Must have chemical engineering degree and not less than five years experience in design and/or operation of chemical process plants. Special knowledge desirable in distillation and high pressure technology. Process Engineer applicants should have healthy curiosity about processes, ability to calculate material and heat balances, knowledge of practical pre-design, and ability to prepare estimates.

Send detailed resume outlining education, experience and salary requirements to:

Manager of Personnel

VULCAN-CINCINNATI, INC.
120 Sycamore Street
Cincinnati 2, Ohio

FIELD ENGINEER

Nationally known organization offers excellent opportunity for young civil engineer graduate. Engineering consulting and promotional work in highway and concrete fields. Location Ohio, Western Pennsylvania and Kentucky area. Car allowance and expenses. Permanent position. Salary based on qualifications and experience.

P-6996, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

Concrete Pipe Plant Superintendent

Nationally known diversified corporation has immediate opening for a superintendent in one of its concrete pipe plant operations. To qualify applicant must have experience with McCracken machine concrete pipe production and maintenance and be capable of assuming responsibility for quality, labor relations, etc.

Salary and supplemental benefits program will be commensurate with experience and responsibility. Send complete resume of your experience, education and other qualifications to

P7172 Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

EXPERIENCED REINFORCING BAR DETAILER WANTED

by established steel company in New York City. Permanent. Good starting salary and other benefits. In reply give experience and salary expected.

OUR EMPLOYEES KNOW OF THIS AD

P-7274, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

GENERAL MANAGER
CRUSHED STONE QUARRY OPERATION

*** Ready Mix and Bituminous Concrete**
*** Precast Pipe and Prestressed Concrete**

Nationally known diversified operation has immediate opening for proven management executive experienced in this field.

The man we seek must have had responsibility for the direction and management of all phases of the business—mining, manufacturing, distribution, purchasing, sales and administration services; as well as ability to promote growth from present $4,000,000 annual sales to its highest potential in active market area.

Salary, and supplemental benefits programs will be commensurate with experience and responsibility. Position offers good opportunity for advancement to successful applicant. Send complete resume of your experience, education and other qualifications to:

P-7134, Engineering News-Record
Classified Adv. Div., P. O. Box 12, New York 36, N. Y.

ENGINEERING DESIGN PERSONNEL

Highway & Bridge Designers, Highway & Bridge Draftsmen

Career opportunities for individuals interested in professional recognition ample opportunity for advancement based on merit, plus group life insurance, hospitalization, paid vacation and holidays.

EXPERIENCE REQUIRED

Mail Resume To F. W. Ahern, Personnel Director

MICHAEL BAKER, JR., INC.

Consulting Engineers

Baker Building **Phone: SPruce 4-3010** **Rochester, Penna.**

INDUSTRIAL ENGINEER

The City of Lakeland, Florida, Department of Electric and Water Utilities, is accepting applications for position of Industrial Engineer. Applicants must have degree in mechanical, electrical or industrial engineering with at least five years in supervisory or staff responsibilities in public or private utility plant. Approximately ten years experience in various phases of industrial engineering. Excellent opportunity, Salary $10,000 to $12,000. Retirement, leave and insurance benefits. Contact Emory E. Walker, Personnel Director, Civil Service Office, City Hall, Lakeland, Florida, or C. D. McIntosh, Jr., Director of Department of Electric and Water Utilities, City Hall, Lakeland, Florida.

SOILS ENGINEERS

Two engineers with MSCE (Soils Mechanics) Degree plus minimum of two years experience in design.
Four engineers with MSCE (Soils Mechanics) and no experience or BSCE with minimum of two years design experience in soils mechanics.
Will consider more experienced men for above or higher positions providing the previous experience has been in design of dams and hydraulic structures.
Please send complete resume to Personnel Manager.

HARZA ENGINEERING CO.
400 West Madison Street, Chicago 6, Ill.

GRAVER

has excellent openings for the following list of qualified personnel:

Junior and Senior Estimating Engineers
Stress Analysts (Research)
Chemical Engineers (Research)
Welding Development Engineers
Metallurgical Engineers
Design Engineers (Plate Structures)
Junior and Senior Contracts Engineers

All of the above should hold degrees and their training and experience should be on structural design as related to large plate structures; such as, field erected containers, towers, stacks, etc. Address all applications to: Industrial Relations Department,

GRAVER TANK & MFG. CO.
Division—Union Tank Car Company,
35 East Wacker Drive, Chicago 1, Illinois

SPECIFICATION WRITER

Experienced in sanitary engineering, capable of heading up specification division with growing consulting engineering firm. Excellent opportunity for right man. New England location. Resume in confidence.

P-7252, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

HYDRAULIC ENGINEERS

Mechanical–Reports Specifications

Supervisory Design Engineer

Major design and supervision of design for dams, power plants, canals and other hydraulic works. Must be top man, minimum of ten years experience, capable of directing and producing work.

Hydraulic Design Engineers

Planning, investigations, design of dams, power plants, canals and other hydraulic works. Minimum of five years experience. Several positions available.

Mechanical Engineer

Design of large gates, valves, power plant mechanical equipment and related work on hydraulic projects. Some experience desirable.

Reports and Specifications

Engineer, Civil or Mechanical, for preparation of reports and/or specifications for hydraulic projects. Minimum of five years experience.

All positions are in our Denver office. Salary commensurate with ability and experience including excellent employee benefits. Submit complete resume with references and salary requirements to:

Tipton and Kalmbach, Inc., Engineers
831-14th Street
Denver 2, Colorado

CIVIL ENGINEER

Must be graduate with at least five years experience by large heavy construction contractor in Chicago. Estimating and surveying under a Chief Engineer. If suitable opportunity to become Chief Estimator. Excellent opportunity as several of our executives have started with us in similar jobs. Please send resume to

P-7267, Engineering News-Record
645 N. Michigan Avenue, Chicago 11, Ill.

UTILITIES ENGINEER

The City of Lakeland, Florida, Department of Electric and Water Utilities, is accepting applications for position of Utilities Engineer. Applicants must have degree in electrical engineering; registered or capable of being registered in State of Florida. At least five years experience in supervisory or technical staff responsibilities in private or public utility plant. At least ten years experience in engineering capacities of design and programming nature. Excellent opportunity. Salary $10,000 to $12,000. Retirement, leave and insurance benefits. Contact Emory E. Walker, Personnel Director, Civil Service Office, City Hall, Lakeland, Florida, or C. D. McIntosh, Jr., Director of Department of Electric and Water Utilities, City Hall, Lakeland, Florida.

Superintendent Crushed Stone Operation

Nationally known diversified corporation has immediate opening for a superintendent in one of its quarry and bituminous concrete operations.

Experience in this type operation with responsibility for production, maintenance, quality, labor relations, etc. is essential to qualify.

Salary and supplemental benefits program will be commensurate with experience and responsibility. Send complete resume of your experience, education and other qualifications to—

P-7171, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

DRAINAGE ENGINEER

Civil Eng. specializing in drainage design; min. 5 yrs. exp.; design of large scale municipal or subdivision storm sewers. Coll. grad. or equiv. Send resume to Eng. Dept.

LEVITT & SONS, INC.
Levittown, N. J.

REGISTERED LAND SURVEYOR

For work in northern Illinois. Minimum 5 years experience. Usual Benefits—Permanent.

MACCABEE, CAMPBELL & ASSOCS.
173 W. Madison St., Chicago 2, Ill.

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• *POSITIONS VACANT*

Structural Engineer-Midwest consulting firm seeks Ph.D. to design complex steel structures, reinforced and prestressed concrete. Preference will be given to applicants with practical experience. Permanent position with established firm in business since 1929. Moving expenses paid. Send resume, including education, experience, and personal qualifications to P-6245. Engineering News-Record.

• *POSITIONS VACANT*

Sanitary Engineer. Opportunity to assume overall supervision and client contact on sanitary projects for long-established midwestern consulting engineering firm. Experience in all phases of sanitary work is desired. Send complete resume of experience and qualifications. Replies held in strictest confidence. Our employees know of this advertisement. P-7178, Engineering News-Record.

Wanted: Civil Engineer with water and sewage treatment design experience—location Mid-west. Submit complete resume, salary and availability. Write P-7189, Engineering News-Record.

Estimators—Civil, Mech., Electrical: Checking change orders. Please send resume. All replies confidential. P-7176, Engineering News-Record.

Materials Engineers. Graduate or registered. Well versed in testing & control of soils, concrete, and bituminous mixes; familiar with current American highway construction practice. Age 35-50. Salary $9,000 to $12,000; moving allowance. Location east or south (possibly foreign at increased rates). Complete resumes to P-7159, Engineering News-Record.

Civil or Architectural Engineer. Challenging structural design position in an expanding international company. Headquarters in Sioux City, Iowa. Send resume to P-7154, Engineering News-Record.

Detailers, Structural Steel—Fully experienced only—permanent positions—New England Iron Works, P. O. Box 955, New Haven, Connecticut.

Director of Engineering, Ph. D. degree in the field of E.E. or M.E. preferred. Will consider applicant with Master's degree and considerable experience. Responsible for administration and development of four engineering departments. Salary $11,000 up. Location Middle-South. P-7238, Engineering News-Record.

Professor or Associate Professor of Electrical Engineering to teach courses in Electric Circuits and Energy Conversion. Must have Master's Degree in Electrical Engineering. Salary up to $9000. for nine-month tenure. Location Middle-South. P-7240, Engineering News-Record.

Assistant Professor, Electrical Engineering to teach fundamental courses in Electrical Engineering. Must have Master's degree. Salary up to $7200. for nine-month tenure. Location Middle-South. P-7242, Engineering News-Record.

Engineers experienced in design of water and sewage projects. Location, Ohio. Send complete resume and salary requirement. P-7218, Engineering News-Record.

Superintendent of Equipment and Master Mechanic, to take charge of maintenance and repair of non-union paving and excavating company in the Metropolitan Washington, D. C. area. Send resume to P-7210, Engineering News-Record.

Openings for recent Civil Engineer graduates with military obligations completed who desire to learn the construction business. Must be ambitious, aggressive, dependable, use no intoxicants, willing to start in the field on industrial buildings, defense construction, heavy construction, and willing to move. Preferably single. We operate throughout Kansas and adjacent states; offer excellent opportunity for advancement. Martin K. Eby Construction Co., Inc., P. O. Box 1679, Wichita, Kansas.

Permanent openings for Resident Engineers experienced in supervision of construction of large steam power plants and/or high-voltage transmission lines. Degree and registration desirable. Excellent opportunity with consulting engineering firm. Please send resume of education and experience to P-7228, Engineering News-Record.

Materials Engineer: concrete, asphalt, aggregates. Commercial laboratory, N. Y. Metropolitan area. P-7223, Engineering News-Record.

Engineer, Civil-Structural. Minimum 5 years responsible design experience in structures, bridges and foundations. Excellent opportunity in established organization for a competent engineer with initiative and leadership potential. Before interview, please send complete resume of education, experience and qualifications including salary expected to Charles W. Yoder & Associates, 3505 W. Center St., Milwaukee 10, Wis.

(Continued on opposite page)

• POSITIONS VACANT

Electrical Engineer—Experienced in design of electric transmission, distribution and substation facilities. Progressive consulting engineering firm offers permanent employment with opportunity for personal development and advancement potential. Submit resume and salary requirements to Stanley Engineering Company, Muscatine, Iowa.

Director of Public Works—The Village of Palatine, Illinois (Population 12,000) is accepting applications for the position of Director of Public Works. Experience and/or engineering background desired. Includes direction of Street, Water, Sewer, Parking System divisions. Salary range $7,280 to $9,230. Send resume to: Village Manager, Village of Palatine, 54 S. Brockway Street, Palatine, Illinois.

Excellent Opportunity—Wanted young, ambitious, graduate civil engineer with minimum of five years experience in all phases of estimating. Will assist successful young, chief estimator for growing East-West Coast construction company. Submit resume including salary, references and availability to P-7256, Engineering News-Record.

Graduate Engineer, Estimator and Superintendent for heavy construction-bridge and dam construction. Location Ohio and Pennsylvania. P-7245, Engineering News-Record.

North American Mining Company requires Tunnel Inspector with 10 to 15 years tunnel driving and inspection experience in responsible positions, plus knowledge of accounting and warehousing end of business, to act as company representative, with U.S. contractor, for minimum 3 years, during driving of 2 parallel, seven mile long tunnels. Portal located two hours from Peru's capital city of Lima. Age to 55, single or married with small family preferred. Transportation, housing, liberal vacation policy and other fringe benefits. Salaries commensurate with experience. Send resume detailing experience to: Employment Division, Cerro de Pasco Corporation, 300 Park Avenue, New York, N. Y. All replies acknowledged.

Assistant Director of Public Works. Salary $6744-$8616. Graduate Civil Engineer, two or more years municipal administrative experience. Apply Personnel Department, City Hall, Springfield, Missouri.

Manager for Ready Mix Concrete Plant producing about 60,000 CY per year. Must have had previous experience in both operation and sales. P-7262, Engineering News-Record.

Sanitary Engineer-Excellent opportunity with expanding and progressive sanitation district in large midwest metropolitan area. Responsible professional engineering reporting directly to chief executive. Knowledge of principles, practices and administration as related to public health and water pollution control. Graduation from an accredited engineering school with a minimum of five years in water supply or sewage disposal. At least three years of professional experience in santitary engineering. Send complete resume including present salary and salary desired. P-7244, Engineering News-Record.

Wanted: Assistant City Engineer capable of designing sewers, paving, giving grades, drafting sewer inspection and miscellaneous other city work. Retired engineer acceptable. Give salary required. Write: Mr. William J. Krull, City Engineer, City of Hobart, Indiana.

• POSITIONS WANTED

General Superintendent-Proj. Mgr. Hvy Const. roads, bridges, bldgs, flood control tunnels, sewage & sewage disp. Concrete mech. background. PO Box 48 Clayton 5 Mo.

Attorney-Construction Specialist seeks corporate position, or with law office engaged in heavy contracting arbitration, litigation. Technical-practical background in industry custom and usage. Government labor experience. PW-7140, Engineering News-Record.

Registered (2 states) Str. Civil. 30 years exp. 14 years supervision in bridges, buildings, hwys. Associate acceptable. PW-7185, Engineering News-Record.

Cost Accountant—14 years experience 5 of which were in the construction field. Married, white, 41 years of age. PW-7180, Engineering News-Record.

• POSITIONS WANTED

Project Manager — Experienced — Public Works. Penna. or New York area. PW-7158, Engineering News-Record.

Structural Engineer and Architect—Registered in Illinois. Extensive experience. Position as Chief Engineer or partnership. PW-7193, Engineering News-Record.

Construction Estimator, 58, A-1 ability. Can take full charge of bid. Fully experienced all phases & types of bldg. const'n, sub-contract neg., purchases, exped'g costs. Min. $12,000. PW-7145, Engineering News-Record.

Executive 35—12 years all phases Building Construction, currently officer medium size firm heavy in industrial relations & contract work. PW-7212, Engineering News-Record.

Chief Estimator now employed desires connection in South—25 years experience building & heavy construction—best references—available reasonable notice to present employer. PW-7255, Engineering News-Record.

Purchasing Agent, field office mgr. 20 yrs. job site experience. All types building & heavy const. Cost conscious. PW-7250, Engineering News-Record.

Fld. Eng.—25, Survey Pty Chf., exp. hwys, bdges, sub-div layout, office work, take off & drafting. PW-7259, Engineering News-Record.

Specifications, Conts., Writer. 15 years exp. bldg. construction, legal & technical phases. Fed Gov't, state, municipal, industrial, commercial projects. PW-7249, Engineering News-Record.

Purchasing—12 yrs. exp. covering all types materials & equip. for heavy constr. Have had good admin. & gen. bus. training. Exp. with sub-contracts, analyzing bids etc Good at detail & setting up procedures. PW-7248, Engineering News-Record.

BSCE 10 yrs. construction experience. Age 35. Prefer southern location. Resume upon request. PW-7260, Engineering News-Record.

• POSITIONS WANTED

Engineer-Estimator-Purchasing Agent. Graduate, registered with 20 years good experience all phases of heavy industrial, commercial, and public works construction. Management potential. Available six weeks. PW-7272, Engineering News-Record.

Yng Woman, Admin. Asst., Gal Fri. Exec. Secty, considerable exper. all phases genl constr. office. All office skills-knowl. of plans, specs, & expedtg. Background in purch. includ. very hvy contact w/subs & suppliers. Excelnt. knowl. subcontracts. Faml w/biddg procedures, requisitions & submission shop dwgs., etc. Prefer NYC (Manhattan) office. PW-7277, Engineering News-Record.

Registered Structural Engineer, B.S.C.E., age 41, 15 years experience in industrial work. Chicago area preferred, but may relocate. References and resume on request. PW-7276, Engineering News-Record.

Project Administration-Supervision from contract to completion. 30 years experience heavy construction of subways, superhighways, tunnels, sewage treatment plants, land development and high rise architectural structures. 25 years as resident or administrative engineer in complete charge of construction. Resume submitted upon request. PW-7275, Engineering News-Record.

Your Inquiries to Advertisers Will Have Special Value . . .

—for you—the advertiser—and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publishers to secure more advertisers and—more advertisers mean more information on more products or better service—more value—to YOU.

SEARCHLIGHT SECTION

CLASSIFIED ADVERTISING

BUSINESS OPPORTUNITIES - EQUIPMENT - USED or RESALE

DISPLAYED RATES

The advertising rate is $25.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured 7/8 inch vert. on one col., 3 columns—30 in. to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

UNDISPLAYED RATES

$2.70 a line, min. 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-eighth year.
Write today without obligation
WILSON *Engineering Corp.*
College House Offices HARVARD SQ., CAMBRIDGE, MASS.

LOW COST INSTALLATION AND OPERATION
CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM OR DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT OR BUY

FOR
DAMS
BRIDGES
BREAKWATERS
FILTRATION AND
SEWERAGE PLANTS

FOR
SPEED
ECONOMY
EFFICIENCY
FLOOD SAFETY
LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

CONSTRUCTION SUPERVISION

Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.

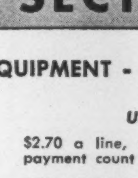
National Schools of Construction
Est. 1952
Satsuma, Florida

WANT TO PURCHASE
Construction or Engineering Firm

Entire interest or working control in a large well established construction company or engineering company with a successful record of having completed large-scale projects. We will pay cash for this acquisition and give to present management a profit participating management contract for a period of years. We can furnish excellent bank reference and we are placing this advertisement as principals.

Send three year profit and loss statement and balance sheet, plus business description to

BO-7216, Engineering News-Record
Class Adv. Div., P.O. Box 12, N.Y. 36, N.Y.



U.S. ARMY EE-8

Telephone fully reconditioned at 2 for $35.00. Any number can be used on same line. Wire 1¢ per ft. or $35.00 per mile. Write for complete telephone list.

TELEPHONE ENGINEERING CO.
Dept. ENR-8171 Simpson, Pa.

BARGE MOUNTED WHIRLEY

1—Model 685 American Steam Whirley Crane, mounted on a 120'x30'x7'-6" steel barge. Crane equipped with a 9"x10" American 3-drum steam hoist, a 7"x8" American steam swinger, and an 85 HP steam boiler rated at 135 lbs. Boom 100'. Barge deck and bottom 3/8" plate, sides 5/16". There are 2 water-tight and 2 open-type bulkheads. Oil and water storage—10,000 gal. each.

PRICE at Portsmouth, Ohio............................$30,000.00

Contact

GUY F. ATKINSON COMPANY
10 West Orange Ave. So. San Francisco, Calif.
Phone: PLaza 6-0300, Ext. 279

FOR SALE

1150-B Bucyrus-Erie
DRAGLINE

Excellent mechanical and electrical condition.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton National Bank Bldg.
Hazleton, Pa. - - GL 5-3658

FOR RENT

3—MANITOWOC 3900-Bs
1958-59

Fully independent. Available immediately. Loaded on cars F.O.B. Niagara Falls. Priced very reasonably.

KOCH CRANE & DERRICK CO.
Bronx, N. Y. KI 2-3800

10 MACK DUMPS

MODEL LRVSW

24 yard capacity—Cummins 400 HP engines—torque converters—power steering—1600 x 24 tires, front & rear. In excellent condition. Location: 6 in Minn., 4 in Kansas City. Also 2 Euclids—35 ton 4FFD's in very good condition.

ERNIE RIEKE EQUIPMENT COMPANY
3311 Merriam Lane--Kansas City 3, Kan.
Telephone—days, HE 2-1601;
nights, CO 2-7733

EUCLIDS

Three 14TDT-122W-17 yd.

Button Dumps—Used Less than 6 Months—Excellent Condition.

For Rent or Sale

Immediately Available, Subject to Prior Disposition.

L. B. SMITH, INC.
HE 7-2611
Court Street Road, Syracuse 6, N. Y.

FOR IMMEDIATE SALE

LOCATED TRINIDAD

2 Steel Diesel Tugs, Built 1955, Dimensions 42'x13'x6'6", Engine GM 610-220 HP

LOCATED ECUADOR

Steel Diesel Tug, Built 1948, Dimensions 47'x12'x7', Engine GM 671-170 HP

Steel Water Barge, Built 1954, Dimensions 60'x30'x6', Capacity 140 tons

ALL EQUIPMENT IN EXCELLENT CONDITION

FS-7137, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

Used Equipment For Sale

True Gun All Equipment
One Model G4 True Gun All Machine
One Model G4A True Gun All Machine
One Truck Mounted Schramm 315 Air Compressor

This equipment was purchased for one special job, has had excellent maintenance and is in very good condition.

For Information Contact:
John Williams
CEdar 3-5435 or write:

LENOX CONSTRUCTION COMPANY
3393 Peachtree Road, N. E.
Atlanta 26, Georgia

FOR SALE OR RENT

MANITOWOC 3900-A LIFT CRANE. NEW 1959. 130' BM. 30' JIB. IND. BM. HOIST & SWING. 48" TREADS. DUAL CONTROLS.
LORAIN L50 CRANE-DRAGLINE. 1 YD. NEW 1951. 60' BM. IND. BM. HOIST. GM DIESEL-TORQUE CONV. 30" TREADS. DUAL CONTROLS.
50 TON AMER. 3046 STIFFLEG DERRICK 130' BM.
200 HP AMER. #180 3D ELEC. HOIST. NEW 1956.
25 TON IND. BH. #5 DIESEL LOCOM. CRANE.
45 & 25 TON GE DIESEL ELEC LOCOS.
40 TON AMERICAN 408 DIESEL LOCO. CRANE.

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.

MANITOWOC Undercarriage—Model 3000 Includes king pin, car body, 12'-4" crawlers and 34" pads. Good Condition.........$3,500.00

CATERPILLAR D-13000 Diesel Engine. Good running shape. Asking...............$3,000.00

ANDERSON EQUIPMENT COMPANY
P.O. Box 427, Bridgeville, Pa.
(Pittsburgh area)
Phone: LEhigh 1-6020

For Sale **DERRICK** **For Rent**

American Hoist & Derrick Co.
50 Ton stiffleg Model 3046-130
200 HP Model 180 3 Dr. Hoist
30 HP Model 780Y Swinger.

TINKLER EQUIPMENT CO.
2590 Oakdale Ave. San Francisco, Cal.
Mission 7-7677

"SEARCHLIGHT" Can Help You!

Hundreds of miscellaneous business problems that confront you from time to time, can be solved through the use of the SEARCHLIGHT SECTION of ENGINEERING NEWS-RECORD.

When you want to buy or sell used or surplus new equipment and/or accessories, or have other business wants—advertise them in the SEARCHLIGHT SECTION for quick, profitable results!

RAILS-TIES

TRACK ACCESSORIES

RAILS

MIDWEST STEEL CORP.
502 DRYDEN STREET
CHARLESTON, W. VA.

RAILROAD Cross and Switch TIES

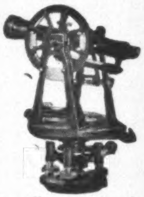
Promptly from adequate stocks
NEW and USED *(as available)*

GILLIS & COMPANY
134 Breckenridge Lane Louisville 7, Ky
TW 5-9484

SURVEYING INSTRUMENTS

USED • REBUILT • SALE
RENT • REPAIRING

TRANSITS AND LEVELS



New or Rebuilt
Sale or Rent

Headquarters for REPAIRS — any make — Factory Service We will also *buy* your old instruments or take them in *trade*.

A complete line of Engineering Instruments and equipment for field or office. Write for catalog NRL 208.

WARREN-KNIGHT CO.
Manufacturers of Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

ALL MAKES

RE-BUILT
REPAIRS
RENT
REAL EXPERTS

BUFF

69 Dey St., New York WOrth 2-2797

TRANSITS & LEVELS

Various Makes
NEW & REBUILT

Fully equipped modern shops — all makes and models repaired — all work guaranteed — prompt service — complete line field supplies.

INSTRUMENTS RENTED

Midwest Distributors for W. & L. E. Gurley and Wild Heerbrugg Instruments

NATIONAL BLUE PRINT CO.
Established 1914.
210 S. Canal St. Chicago (6), Ill.

PIPE

Surplus New & Used
FOR SALE, WANTED OR RENT

STEEL PIPE

NEW — STRUCTURAL — RECONDITIONED
VALVES & ALL TYPE FITTINGS
COMPLETE FABRICATION FACILITIES

GREENPOINT PIPE SUPPLY CORP.
341 Stagg Street, Brooklyn 6, N. Y. EV. 6-7200

ASSOCIATED PIPE & FITTING CO., INC.

- PILING PIPE SHELLS MANDREL FITTINGS
- "H" BEARING PILE-POINTS AND SLEEVES
- TIMBER SPLICERS AND SHOES
- CULVERTS CIRCLE ARCH SECTIONAL

262 RUTHERFORD BLVD., CLIFTON, N.J. • PR 3-8400

Call: HYACINTH 7-4900

PIPE, VALVES & FITTINGS
PILING • CULVERTS
ASBESTOS-CEMENT PIPE • ALUMINUM PIPE

ap

ALBERT PIPE SUPPLY CO., Inc.
103 VARICK AVE., BROOKLYN 37, N.Y.

GENERATOR SET

For sale or rent. 150-KW-440V—GE—3ph. GMC diesel power, mounted in enclosed trailer van, with fuel tank.

CLINE CONSTRUCTION EQUIPMENT, INC.
3501 Gardner Ave., HU 3-1225,
Kansas City, Missouri

FOR SALE

LORAIN MOTO CRANE

Model MC-875 80-Ton Capacity, 190'0" Main Boom, 30'0" Jib.

WILLIAM F. HEGARTY
P.O. Box #41, Livingston, New Jersey
Phone: TUcker 7-4100 Whippany, New Jersey

BIRMINGHAM 80 ton Rotary Car Dumper, standard gauge, good. $20,000

NORTHWEST 6 SHOVEL FRONT complete w/3rd drum & deck mchy. Like new. $5500

(2) **BYRON JACKSON** 10" Vertical Pumps, 4 stage, 1500 GPM @ 305' hd. Mdl. 3KH. with 150 hp. motors, 2300 volt, 60 cycle, 3 phase. Excellent. 1/3rd price. $1500 each

300 **KVA TRANSFORMER** General Electric #1529. oil type, 3 phase, 60 cycle, 4160Y volts primary, 240-480 volts secondary, also connects lower voltage, late mdl. 1/3rd price. $1000

BARBER GREEN 832 Portable Dryer, 52" x 16' drum, w/elevator, burner, feeder. Good. $4750

WENZEL MACHY. CO.
565 S. 10th, Kansas City, Kans. MA 11710

PILING

SURPLUS·NEW and USED
For Sale, Wanted or Rent

STEEL SHEET PILING

PROMPT SHIPMENT TO ANY PART OF THE COUNTRY

MP-115—15 to 60 ft.—Kansas City
MP-116—20 to 60 ft.—Tennessee
MP-115—15 to 60 ft.—Chicago
MP-116—17 to 19 ft.—Montana
MP-116—25 to 29 ft.—Oklahoma
MP-112—14 to 16 ft.—Missouri
MP-101—16 to 37 ft.—Indiana
MZ- 38—14 to 56 ft.—Illinois
MP-116—20 to 50 ft.—Kansas City
MP-116—17 to 30 ft.—Idaho
MP-115—15 to 60 ft.—Tennessee
MP-116—21 to 23 ft.—Nebraska
MP-116—20 to 60 ft.—Chicago
MP-116—25 to 30 ft.—Arkansas

PILE DRIVING EQUIPMENT

- DRIVING CAPS • DROP HAMMERS • HOISTS & DERRICKS
- Vulcan and McKiernan-Terry PILE HAMMERS / EXTRACTORS
- BOILERS • MANITOWOC CRANES

CONMACO, INC.

Kansas City, Kansas
804 Kansas Avenue
Phone: DRexel 1-3930

Chicago, Illinois
327 North Bell Avenue
Phone: CHesapeake 3-9354

Faster From Foster

STEEL-SHEET
PILING

All sections from our regular stocks

L. B. FOSTER CO.
Pittsburgh 30 · New York 7 · Chicago 4 · Houston 2
Los Angeles 5 · Atlanta 8 · Cleveland 35

PILING IN FLA. & LA.

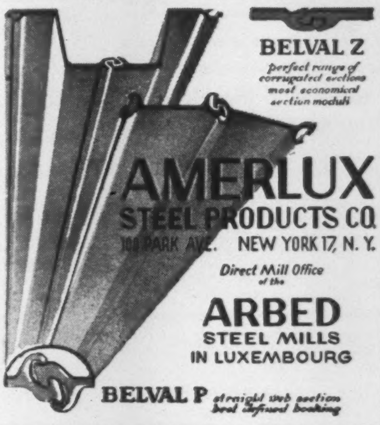
1500 pcs. Belval III-A—14', 25', 28', 34', & 40'
1700 pcs. Larssen II—20', 25', 30', & 40'
900 pcs. AP-3, DP-2—15', 20', 25', 30', 50'-60'
500 pcs. H—10"—42 lb. 12"—53 lb. 14"—73 lb.
1200 pcs. MP-112—15', 28', 32', 40' & 60'
Link-Belt Diesel Pile Hammer Model 312

SEABOARD STEEL PILING—TEL. 958-0461
P. O. Box 5071—Sarasota, Fla.

When you need PILING . . . fast

use this section, as many contractors do, as a piling buying directory. It can save you time when you want to know quickly, where to buy good new or used piling.

STEEL SHEET PILING



BELVAL Z
perfect range of corrugated sections most economical section moduli

AMERLUX
STEEL PRODUCTS CO.
100 PARK AVE. NEW YORK 17, N. Y.

Direct Mill Office of the

ARBED
STEEL MILLS
IN LUXEMBOURG

BELVAL P *straight web section best defined booking*

H & SHEET STEEL PILING

1400 PCS. BP8, BP10, BP12—BP14—55' to 60'
3700 PCS. BETH. SP6A 50', 56' 48' & 40' & 35'
1900 PCS. MP112—12' 15' 20' 25' 31' 35' & 60'
2800 PCS. BETH.—AP3 10, 15', 20', 25', 30' & 60'
2500 PCS. BETH.—DP2—20', 25', 30', 35', 40' & 60'
1200 PCS. ZP38-ZP32—20', 32', 36', 40', 50', 60'
600 PCS. ZP27—20', 26', 31', 40', 45', 60'
500 PCS. 10' & 15' Corrugated Piling

PILING BOUGHT—SOLD—RENTED
STOCKS: N. Y.—BOSTON—BUFFALO
TORONTO—BALTIMORE—JACKSONVILLE
MIAMI—RICHMOND—NEW ORLEANS

DIESEL LOCOMOTIVES & CRANES
12—Gen. Elec. 100, 80, 70, 65, 45, 25, & 23 ton
25 Ton Industrial Loco Crane 60' Boom

7250' & 3600' JOY ELEC AIR COMPRESSORS
Both—2300 V-WN 224C-Radial New 58

R. C. STANHOPE, INC.
60 E. 42nd St. N. Y. 17, N. Y.
Telephone MU 2-3075 or MU 9-1898

STEEL SHEET
PILING by DIALING
Call St. Louis Collect
CHestnut 1-4474

RENT, SELL OR BUY
PIPE H-BEARING PILE
FAST SERVICE
NATION-WIDE STOCKS
LOW RATES
ALL LENGTHS
ALL SECTIONS

PILE DRIVING EQUIPMENT
NORTH, SOUTH, EAST or WEST

MISSISSIPPI VALLEY EQUIPMENT CO.
(WHISLER STEEL PILING CO.—Affiliate)
1908-A Railway Exchange Bldg.
St. Louis 1, Mo. CHestnut 1-4474

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on following pages

NEW ENGLAND

Goodkind & O'Dea
Consulting Engineers
Design and Supervision
Foundations, Structures, Highways
1214 Dixwell Ave. Hamden, Conn.
610 Bloomfield Ave, Bloomfield, N. J.
325 Spring Street, New York, N. Y.
108 W. Lake Street, Chicago 1, Ill.

John J. Mozzochi and Associates
Civil Engineers
Highways - Airports - Developments
Survey - Design - Inspection
217 Hebron Avenue 200 Dyer Street
Glastonbury, Conn. Providence, R. I.

Fay, Spofford & Thorndike, Inc.
Engineers
Industrial Plants Incinerators
Water Supply, Sewerage, Drainage
Bridges Express Highways
Port and Terminal Work Airports
Designs Investigations
Supervision of Construction
Boston 8, Massachusetts

Jackson & Moreland, Inc.
Jackson & Moreland Int'l., Inc.
Engineers and Consultants
Electrical—Mechanical—Structural
Design and Supervision of Construction
-:- for -:-
Utility, Industrial and Atomic Projects
Surveys—Appraisals—Reports
Technical Publications
Boston Washington New York

Chas. T. Main, Inc.
Engineers
Design and Supervision of Construction for Industrial Plants—Electrical, Steam and Hydraulic Engineering—Investigations, Reports, and Appraisals.
Boston, Mass. Charlotte, N. C.

Metcalf & Eddy
Engineers
Soils, Foundations, Waterworks, Sewage Works, Drainage, Irrigation, Flood Control, Refuse, Industrial Wastes, Airports, Highways, Military Projects, Industrial and Commercial Facilities.
Statler Building, Boston 16,
Massachusetts

Moore Survey & Mapping Corp.
Engineers-Photogrammetrists-Surveyors
Geodetic Control—Construction Layout
Aerial Topographic Surveys—Tax Maps
Hydrographic Surveys—Photogrammetry
29 Grafton Circle—Shrewsbury, Mass.

MIDDLE ATLANTIC

Airways Engineering Corp.
Airports, highways, dams, fuel storage, pipe lines, aerial topographic mapping.
1212-18th St., N.W.,
Washington 6, D. C.
Phone: REpublic 7-8131

Whitman, Requardt & Associates
Engineers—Consultants
Civil—Sanitary—Structural
Mechanical—Electrical
Reports Plans, Supervision, Appraisals
1304 St. Paul St., Baltimore 2, Md.

Baker-Wibberley & Associates, Inc.
Consulting Engineers
Civil, Sanitary, Structural,
Foundations, Soils
49 N. Jonathan St., Hagerstown, Md.
Baltimore, Md. Waynesboro, Pa.

Ewin Engineering Corporation
Designers of Port Facilities, Foundations, Industrial Plants, Bridges, Highways, Sewage Disposal and Urban Renewal.
5104 MacArthur Blvd. N.W.
Washington, D. C.
DuPont Plaza Center, Miami 32, Fla.
150 Savannah St. Mobile, Ala.

Louis Berger & Associates
Consulting Engineers
Highways-Bridges-Dams-Airfields
Structures-Buildings-Industrial Plant-
Military Installations-Foundations
Studies-Reports-Planning-Design
177 Oakwood Avenue, Orange, N. J
2nd and Locust Streets, Harrisburg, Pa.
200 S. Main Street, Salt Lake City, Utah
1505 Delashmut Ave., Columbus 12, Ohio
46 Baseler Strasse, Frankfurt/Main, Ger.
8 rue de Neuchatel, Geneva, Switzerland
Torre de Madrid, Madrid, Spain
12 Jinnah Avenue, Dacca, East Pakistan
206 Asia Life Insurance Bldg., Kuala Lumpur, Malaya
Rangoon, Lahore, Lagos, Hong Kong

Joseph S. Ward and Associates
Consulting Soil and Foundation Engineers
Site Investigation, Boring Supervision, Laboratory Soil Testing, Foundation and Pavement Analysis and Design, Construction Supervision, Engineering Reports and Consultation
91 Roseland Avenue Caldwell, N. J
Jefferson Building Phila., Penn

Victor J. Lo Pinto Associates
Consulting Engineers
SOILS - FOUNDATIONS - HIGHWAYS
Investigation - Design - Supervision
Sub Surface Exploration
Laboratory and Field Tests
Land Development Engineering
58 Branchport Ave., Long Branch, N. J.

Albert C. Jones Associates
Consulting Engineers
Private and Municipal Engineering
Sewerage-Sewage Treatment
Water Supply and Distribution
Investigations and Appraisals
Photogrammetric Engineering
Aerial Maps
223 High St. Mount Holly, New Jersey

Edwards and Kelcey
Engineers and Consultants
Traffic Transportation Parking
Expressways Airports Public Works
Surveys - Reports - Design - Supervision
3 William Street, Newark 2, New Jersey
Boston Salt Lake City New York
Providence Minneapolis

Porter & O'Brien
O. J. PORTER & COMPANY
CONSULTING ENGINEERS
Airports — Highways — Expressways — Buildings — Bridges — Dams — Harbors — Foundations — Stabilization — Pavements
Reports, Designs & Supervision
415 Frelinghuysen Ave., Newark 5, N.J.
4201 Sunset Blvd. Los Angeles 29, Cal.
1421-47th Avenue Sacramento 22, Cal.

Boswell Engineering Co.
Consulting Engineers
Highways, Bridges, Airports, Municipal
Ridgefield Park, N. J.
West Nyack, New York
Salt Lake City, Utah
Anchorage, Alaska

B. K. Hough
Consulting Engineer
Soils & Foundation Engineering
Site investigations, soil testing, design analysis for earthworks, foundations and pavements, field inspection, engineering reports, consultation.
121 E. Seneca St. Ithaca, New York

Clinton Bogert Engineers
Consultants
Ivan L. Bogert Robert A. Lincoln
Charles A. Manganaro William Martin
Water & Sewage Works Incinerators
Drainage Flood Control
Highways and Bridges Airfields
145 E. 32nd St., New York 16, N. Y.

Ammann & Whitney
Consulting Engineers
Design and Supervision of Construction of Bridges, Highways, Expressway, Buildings, Special Structures, Airports and Airport Facilities
111 Eighth Avenue, New York 11, N.Y.
Milwaukee - Washington - Philadelphia
Paris - Athens - Tehran

Blauvelt Engineering Co.
CONSULTING ENGINEERS
Highways,
Bridges,
Reports
New York, N. Y. Philadelphia, Pa.
Woodbury, N. J. Crystal Lake, Ill.

Bowe, Albertson & Associates
Engineers
Water and Sewage Works—Industrial Wastes — Refuse Disposal — Valuations —Laboratory Service
75 West St. 1000 Farmington Ave.
New York 6, N.Y. W. Hartford 7, Conn.

Brown Engineers
Brown Engineers International
Architects—Engineers—Planners
Airports, Bridges, City Planning, Commercial Buildings, Dams, Highways, Housing, Hydraulics, Hydroelectric Power, Industrial Plants, Ports, Railroads, Sewerage, Transportation Studies, Urban Renewal, Water Supply.
Studies—Design—Management
Supervision of Construction
Coliseum Tower
10 Columbus Circle
New York 19, N. Y.

Buck, Seifert and Jost
Consulting Engineers
Water Supply — Sewerage — Hydraulic Developments—Reports and Valuations, Chemical and Biological Laboratories.
New York City, 112 E. 19th St.

Gibbs & Hill, Inc.
Consulting Engineers
Water, Sewage & Industrial Waste Treatment Works — Roads, Bridges & Railroads—Conventional & Nuclear Power Generation — Electric Transmission & Distribution Systems—Industrial & Communication Facilities.
PENN STATION NEW YORK 1, N.Y.

Hardesty & Hanover
Consulting Engineers
Bridges
Fixed and Movable
Highways
Expressways, Thruways
Special Structures
Design, Supervision,
Inspection, Valuation
101 Park Avenue New York 17

Frederic R. Harris, Inc.
Consulting Engineers
New York, N. Y.
Norwalk, Conn. New Orleans, La.
Toronto, Canada The Hague, Holland

Hazen and Sawyer
Engineers
Richard Hazen Alfred W. Sawyer
H. E. Hudson, Jr.
Water and Sewage Works
Industrial Waste Disposal
Drainage and Flood Control
360 Lexington Ave., New York 17, N.Y.

Howard, Needles, Tammen & Bergendoff
Consulting Engineers
Bridges • Structures • Foundations
Admin. Ser. • Traffic & Parking •
Express Highways • Airports
Kansas City - Cleveland - New York

King & Gavaris
CONSULTING ENGINEERS
Associates:
W. Mack Angas
David Carsen
Dr. G. P. Tschebotarioff
Sidney Zecher
Bridges, Highways, Tunnels
Waterfront Structures, Reports
Investigations, Foundations
Design & Supervision of Construction
41 E. 42nd St., New York 17, N. Y.

Litchfield Whiting Bowne & Assoc.
Engineers—Architects
Sewage, Water, Bridges, Airports, Flood Control, Electrification, Hospitals, Schools, City Planning, Abbatoirs, Highways, Air Conditioning, Industrial Buildings, Military.
8 West 40th St., N. Y. 18, N. Y.
Rome Tehran Bangkok

Modern Engineering Corporation
Design—Consulting
62 William Street, New York, N. Y.

Moran, Proctor Mueser & Rutledge
Consulting Engineers
Foundations for Buildings, Bridges and Dams; Tunnels, Bulkheads, Marine Structures; Soil Studies and Tests; Reports, design and supervision.
415 Madison Ave., New York 17, N.Y.
Eldorado 5-4800

Parsons, Brinckerhoff, Quade & Douglas
ENGINEERS
Bridges, Highways, Tunnels, Airports, Subways, Harbor Works, Dams, Canals, Traffic Parking and Transportation Reports, Power, Industrial Buildings, Housing, Sewerage and Water Supply.
165 Broadway New York 6, N. Y.

E. Lionel Pavlo
Consulting Engineer
Design, Supervision, Reports
Bridges, Highways, Expressways
Marine Structures, Public Works
Industrial Construction, Airports
642 Fifth Ave. New York 19, N. Y.

Malcolm Pirnie Engineers
Malcolm Pirnie Carl A. Arenander
Ernest W. Whitlock Malcolm Pirnie, Jr.
Robert D. Mitchell Alfred C. Leonard
MUNICIPAL AND INDUSTRIAL
Water Supply—Water Treatment
Sewerage and Waste Treatment
Drainage—Rates—Refuse Disposal
25 West 43rd St., New York 36, N. Y.
3013 Horatio Street, Tampa 9, Fla.

The Pitometer Associates
Engineers
Water Waste Surveys
Trunk Main Surveys
Water Distribution Studies
Water Measurements & Special
Hydraulic Investigations
New York, 50 Church St.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on preceding and following pages

Alexander Potter Associates
Consulting Engineers
Water Works, Sewerage, Industrial Waste, Hydraulic Works, Reports, Designs, Appraisals.
50 Church St., New York, N. Y.

Praeger-Kavanagh
Engineers
126 East 38th St., New York 16, N. Y.

Seelye Stevenson Value & Knecht *Consulting Engineers*
Richard E. Dougherty, Consultant
Airports, Highways, Bridges, Dams. Water Supply, Sanitation, Railroads, Piers, Industrial Plants, Reinforced Concrete, Steel, Industrial Waste Disposal, Foundations, Soil Studies, Real Estate Development.
Civil — Mechanical — Electrical
101 Park Avenue New York 17, N. Y.

Severud-Elstad-Krueger-Associates
Consulting Engineers
Structural Design - Supervision
Reports - Buildings - Airports
Special Structures
415 Lexington Ave., New York 17, N.Y.

Ole Singstad
Consulting Engineer
Vehicular and Railroad Tunnels, Subways, Ventilation, Expressways, Parking Garages, Air Fields, Foundations, Waterfront Structures.
24 State St. New York 4, N. Y.

Frederick Snare Corporation
Engineers—Contractors
Harbor Works, Bridges, Power Plants, Dams, Docks and Terminals.
Difficult and Unusual Foundations A Specialty
233 Broadway, New York City 7
Havana, Cuba Lima, Peru
Bogota, Columbia, Caracas, Venezuela

Steinman, Boynton, Gronquist & London
Consulting Engineers
HIGHWAYS - BRIDGES
STRUCTURES
117 Liberty St., New York 6, N. Y.

Tippetts-Abbett-McCarthy-Stratton
Engineers and Architects
Ports, Harbors, Flood Control, Power Dams, Bridges, Tunnels, Highways, Railroads, Subways, Airports, Traffic, Foundations Water Supply, Sewerage, Reports, Design, Supervision, Consultation.
375 Park Avenue, New York 22, N. Y.

Arnold H. Vollmer Associates
Consulting Engineers
Highways, Parks, Bridges, Municipal Improvements, Public Works, Reports, Surveys, Contract Plans.
25 W. 45th Street, New York 36, N. Y.
Telephone: CIrcle 7-6250

Lawrence S. Waterbury
Consulting Engineer
Bowling Green 9-9298
26 Broadway, New York 4

Keis & Holroyd
Consulting Engineers
Formerly Solomon & Keis
Since 1906
Water Supply, Sewage Disposal, Garbage & Refuse Incineration, Industrial buildings.
Troy, N. Y.

Capitol Engineering Corporation
Consulting Civil Engineers
Dillsburg, Pennsylvania, U.S.A.

Gannett Fleming Corddry & Carpenter, Inc.
ENGINEERS
Dams, Water Works, Sewage,
Industrial Wastes & Garbage Disposal,
Highways, Bridges & Airports
Traffic & Parking — Appraisals,
Investigation & Reports.
Harrisburg, Penna.
Branch Offices
Pittsburgh, Pa. Philadelphia, Pa.
Daytona Beach, Fla.

Grof & Myers
Consulting Engineers
Highways — Bridges — Airports
Surveys — Reports — Plans
Construction Supervision
1824 North 4th St. Harrisburg, Pa.

Modjeski and Masters
Consulting Engineers
Bridges and other Structures
Foundations
Highways and Expressways
900 North Sixth St. Harrisburgh, Pa.
Philadelphia - Miami - New Orleans

Albright & Friel Inc.
Consulting Engineers
Water, Sewage, Industrial Wastes and Incineration Problems, City Planning, Highways, Bridges and Airports, Dams, Flood Control, Industrial Buildings, Investigations, Reports, Appraisals and Rates
3 Penn Center Plaza Phila. 2, Pa.

Fridy, Gauker, Truscott & Fridy, Inc. *Architects & Engineers*
Water, Sewer, Waste Disposal, Roads, Airports, Power & Lighting, Petroleum Facilities, Hospitals, Schools, Public & Industrial Buildings, Reports, Plans, Supervision, Appraisals.
1321 Arch St. Philadelphia 7, Pa.

Harris-Dechant Associates
Consulting Engineers
Water Supply, Dams, Stream Improvement, Flood Control, Port & Harbor Development; Sanitary & Industrial Wastes; Hydro & Steam Power; Highway Engineering & Design.
Surveys—Reports—Ecoonmics
123 S. Broad St., Philadelphia 9, Pa.

Justin & Courtney
Consulting Engineers
Joel B. Justin - Neville C. Courtney
Dams and Power Problems, Hydroelectric, River Basin Development, Water Supply, Foundations.
121 South Broad Street
Philadelphia 7, Pa.

Yule, Sticklen, Jordan & McNee
ENGINEERS
Bridges, Highways, Airports
Design, Investigations, Reports
Supervision of Construction
Civil, Structural Mechanical
& Electrical
Cedar Cliff Drive
Camp Hill, Pa.
1225 Vine Street
Philadelphia 7, Pa.
5564 North High Street
Columbus, Ohio

Morris Knowles Inc.
Engineers
Water Supply and Purification Sewerage and Sewage Disposal, Valuations, Laboratory, City Planning.
Pittsburgh, Pa.

Pennsylvania Drilling Company
Subsurface Explorations, Grouting,
Industrial Water Supply,
Mineral Prospecting.
Large Diameter Drilled Shafts, Reports
1205 Chartiers Ave. Pittsburgh 20, Pa.

Swindell-Dressler Corp.
CONSULTING ENGINEERS
Industrial Plants — Waterworks — Sewer Systems — Highways — Dams — Bridges — Surveys — Reports — Design and Construction Supervision
Box 1888 • Pittsburgh 30, Pa.

Michael Baker, Jr., Inc.
Consulting Engineers, Planners & Surveyors; Airport, Highway & Bridge Design; Water & Sewerage; Municipal Engineering; Photo Mapping; City Planning urban Ren. & Redev. Surveys; Soils Lab. Home Office—Rochester, Pa. Br. Off. Jackson, Miss. Charleston, W Va., Harrisburg, Pa.

Sprague & Henwood, Inc.
Drilling Services
Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling & Pressure Grouting, Diamond Core Drilling
Main Office
221 W Olive Street, Scranton, Pa.
Branches:
1009 Western Savings Fund Bldg., Philadelphia, Pa.
11 W. 42nd St., New York, New York
300 Mt. Lebanon Blvd., Suite 100
Pittsburgh 34, Pa.
Box 1446—Grand Junction, Colorado
Nashville, Tennessee
Tucson, Arizona
Buchans, Newfoundland

Frank D. McEnteer's Associates, Inc.
Consulting Engineers
Bridges, Highways, Industrial Plants
Design, Investigations, Surveys
Terminal Building, Clarksburg, W. Va.

SOUTH

Harry Hendon & Associates, Inc.
Engineers
Civil Engineers—Public Utilities
Investigation—Designs
Supervision of Construction
P. O. Box 740A 925 Sligh Blvd.
Birmingham 13, Ala. Orlando, Florida

Dames & Moore
Consultants in
Applied Earth Sciences
Soil Mechanics Engineering Geology
Geophysics
Atlanta, Chicago, Honolulu, Houston, Los Angeles, New York, Portland, Salt Lake City, San Francisco, Seattle.

Palmer and Baker Engineers, Inc.
Consulting Engineers - Architects
Surveys-Reports-Design-Supervision
Consultation
Transportation and Traffic Problems
Tunnels-Bridges-Highways-Airports
Industrial Buildings
Waterfront and Harbor Structures
Graving and Floating Dry Docks
Complete Soils, Materials and Chemical Laboratories
Mobile, Ala New Orleans, La.
Washington, D. C.

Rader and Associates
Engineers - Architects
Sewage Disposal, Water Works, Ports, Airports, Bridges, Highways, Office and Commercial Buildings, Industrial Plants. Reports, Investigations, Consultations, Aerial Photography, Photogrammetry.
First Natl. Bank Bldg., Miami 32, Fla.

Standard Drilling Company
Drilling Services
Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling, and Pressure Grouting, Diamond Core Drilling.
P.O. Box 174. Somerset, Kentucky.

Eustis Engineering Company
FOUNDATION AND SOIL
MECHANICS INVESTIGATIONS
Soil Borings *Laboratory Test*
Foundation Analyses *Reports*
3635 Airline Highway
Metairie, Louisiana

Schmidt Engineering Co. Inc.
Consulting Engineers
Investigations, Reports, Designs, Heavy Construction — Dams — Hydroelectric Projects—Foundation Explorations and Treatment—Water and Sewerage Works
Emerson Building Chattanooga, Tenn.
Greater Tenn. Bldg. Knoxville, Tenn.

ETCO Engineers and Associates
Foundation Consultants
Test Borings Laboratory Tests
Recommendations, Design and Supervision
2116 Canada Dry St., Houston 23, Tex.
727 Main St. Baton Rouge, La.
427 Carondelet St., New Orleans 12, La.

Mott Core Drilling Co.
Contractors—Manufacturers
Core Borings for Buildings, Bridges,
Foundation Soil Tests, Highways,
Pressure Grouting, Dams, Mine Shafts
Mineral Prospecting
Mott Bldg. 830 Eighth Ave.
Huntington, 17, W. Va.

MIDDLE WEST

Alvord, Burdick & Howson
CONSULTING ENGINEERS
Water Works
Water Purification
Floor Relief
Drainage
Sewerage
Sewage Treatment
Power Generation
Appraisals
20 North Wacker Drive, Chicago

Consoer, Townsend & Associates
Consulting Engineers
Sewage treatment, sewers, storm drainage, flood control—Water supply and treatment—Highway and bridges—Airports—Urban renewal—Electric and gas transmission lines—Rate studies, surveys and valuations—Industrial and institutional buildings.
360 East Grand Ave. Chicago 11, Ill.

Erik Floor & Associates, Inc.
Consulting and Design Engineers
Hydroelectric Projects — Dams — Flood Control—Hydraulic Structures—Irrigation — Transmission Lines — Investigations—Reports—Designs
139 N. Clark St. Chicago 2, Ill.

When you need a SPECIALIST in a hurry . . .
Engineering News-Record's Professional Service Section offers the quickest, most direct method of contacting consultants who may be available NOW.

THIS SECTION
is available to consulting engineers to contact prospective clients every week or every other week.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on preceding and following pages

De Leuw, Cather & Company

CONSULTING ENGINEERS

Public Transit	Subways
Traffic & Parking	Railroad Facilities
Expressways	Industrial Plants
Grade Separations	Municipal Works
Urban Renewal	Port Development

150 North Wacker Drive, Chicago 6
San Francisco New York Boston

Greeley and Hansen

Engineers
Water Supply, Water Purification
Sewerage, Sewage Treatment
Flood Control, Drainage, Refuse Disposal
14 E. Jackson Boulevard
Chicago 4, Illinois

Harza Engineering Co.

Consulting Engineers

Hydroelectric Plants & Dams
Transmission Lines
Flood Control, Irrigation
River Basin Development

400 West Madison Street Chicago 6

Hazelet & Erdal

CONSULTING ENGINEERS
Fixed & Movable Bridges, Expressways, Industrial Plants, Airports, Dams.
Monadnock Block, Chicago 4, Ill.
Dixie Terminal Bldg., Cincinnati 2, O.
Commerce Bldg., Louisville 2, Ky.
Oding Bldg., Lansing 33, Mich.

Pioneer Service & Engineering Co.

Consulting and Design Engineers
Operations—Purchasing
Construction Management
Public Utilities—Industrials
231 So. La Salle St. Chicago 4

Sargent & Lundy

ENGINEERS
Consultants to the Power Industry
Studies • Design • Supervision
140 South Dearborn Street,
Chicago 3, Ill.

Suhr, Peterson, Peterson & Suhr

Consulting Engineers
REPORTS—PLANS—SUPERVISION
Sewerage, Water Supply, Flood Control & Drainage, Airports, Roads, Surveys
Fixed & Movable Bridges
130 N. Wells St., Chicago 6, Ill.
P. O. Box 1858, Anchorage, Alaska

Chas. W. Cole & Son

Engineers and Architects
3600 E. Jefferson Blvd.
South Bend, Indiana
2112 W. Jefferson St.
Joliet, Illinois

The Hinchman Corporation

Consulting Engineers
"WORLD-WIDE ACTIVITIES"
Survey • Design • Supervision
Specializing In
Corrosion Control•F.C.C. Certification Tests
Electromagnetic Interference Studies
Francis Palms Bldg., Detroit, Michigan

The H. C. Nutting Company

Testing Engineres—Inspection Service
Foundation Investigation—Test Borings
Soil Mechanics—Sewage Flows
Construction Control—Concrete
Water Waste Survey
4120 Airport Road Cincinnati 26, O.

The Austin Company

Design and Construction
Manufacturing and Process Plants
Newspaper and Broadcasting Bldgs.
Power Plants—Industrial
Industrial Office Buildings and Laboratories
Merchandising Bldgs. & Facilities
Plant Location Surveys

New York CLEVELAND Houston
Chicago Montreal Los Angeles
Detroit Seattle

Havens and Emerson

A. A. Burger, H. H. Moseley, J. W. Avery, F. S. Palocsay, E. S. Ordway, A. M. Mock, G. H. Abplanalp, S. H. Sutton
Frank C. Tolles, Consultant
Water, Sewerage, Garbage, Industrial Wastes, Valuation—Laboratories
Leader Bldg. Woolworth Bldg.
Cleveland 14 New York 7

The Osborn Engineering Co.

DESIGNING-CONSULTING

Industrial Plants Office Buildings
Stadiums Grand Stands Field Houses
Bridges Garages Laboratories

7016 Euclid Ave. Cleveland 3, Ohio

Rackoff Associates

Engineers
Highways, Expressways, Bridges, Sewerage and Water Systems, Fiscal and Master Planning, Investigations, Urban Renewal, Supervision
1033 W. Third Ave., Columbus, Ohio

Slocum & Roberts

Construction Consultants
Heavy Construction Project Investigations, Planning, Estimating & Bidding, Plant Layout & Management
504 E. Pine St. 11820 Edgewater Drive
Alhambra, Calif. Lakewood 7, Ohio

Duke Research Corp.

CONSULTANTS

Concrete Pipe Plants; Equipment, Machine, Cast or Vacuum Process. Mechanical Joints: Concrete or Vitrified, Tylox Rubber, Snap-On "O" Ring or Plastisol.

P. O. Box 403
New Philadelphia, Ohio

Jones, Henry & Williams

Consulting Sanitary Engineers
Water works Sewerage & Treatment
Waste Disposal
2000 W. Central Ave., Toledo 6, Ohio

Toledo Testing Laboratory

Engineers—Chemists

Concrete—Soils—Asphalt
Inspection Research
Tests Development
Foundation Investigation
Borings—Diamond Drilling
Load Tests
Soils Mechanics Laboratory
1810 North 12th St. Toledo 2, Ohio

Consultants

Three channels for new business are open to you: first, through your personal acquaintance among influential men in your field of specialization; second, recommendation as a result of services performed, and third, through this PROFESSIONAL SERVICES SECTION

For information write:

ENGINEERING NEWS-RECORD
Classified Advertising, P.O. Box 12,
New York 36, N. Y.

WEST OF MISSISSIPPI

Heron Engineering Co.

Consulting Engineers
For all types of Aerial Tramways, Cableways, and Suspended Structures
2000 South Acoma St.
Denver 23, Colorado

Stanley Engineering Company *Consulting Engineers*

Hershey Building 208 S. LaSalle St.
Muscatine, Ia. Chicago 4, Ill.
Hanna Building
Cleveland 15, Ohio

R. L. Loofbourow

Consulting Mining Engineer
Site Tests, Plans, Estimates & Supervision for Underground Construction, Mining and Control of Rock and Water.
4032 Queen Ave So., Minneapolis 10, Minn.

Black & Veatch

Consulting Engineers

Water - Electricity - Sewage - Gas - Industry - Reports, Design, Supervision of Construction, Investigations, Valuation and Rates.

1500 Meadow Lake Parkway
Kansas City 14, Missouri

Burns & McDonnell

Engineers—Architects—Consultants

4600 E. 63rd St. Trafficway
Kansas City 41, Missouri

Russel and Axon

Consulting Engineers
Civil — Sanitary — Structural
Industrial — Electrical
Rate Investigations
408 Olive St. St. Louis 2, Mo.
Municipal Airport, Daytona Beach, Fla.

Sverdrup & Parcel Associates, Inc.

Engineers—Architects
Bridges, Structures and Reports, Industrial and Power Plant Engineering
915 Olive St., St. Louis, 1, Mo.
417 Montgomery St., San Francisco Calif.

Benham Engineering Company

Established in 1909
Design and Consulting Engineers
215 N E 23rd Street
Oklahoma City 5, Oklahoma

Spencer J. Buchanan and Associates, Inc.

Consulting Engineers
Soil Mechanics and Foundation Engineering. Civil Engineering Services Reports, Design and Field Supervision.
310 Varisco Building, Bryan, Texas
TAylor 2-3767

Soil Mechanics Incorporated

Foundation Exploration and Testing Serices

Site Investigations, Soil Borings, Field and Lab Testing, Load Tests, Reports
310 Varisco Building, Bryan, Texas
TAylor 2-3767

ALWAYS READY

Yes, these consultants are always ready to help you with any problem concerning engineered construction. Call on them with the assurance that you will be receiving the finest of professional advice.

Lockwood, Andrews & Newnam

Consulting Engineers
Navigation Facilities — Public Works
Airports — Earthworks — Roads,
Structural, Mechanical — Electrical
Reports — Design — Supervision
Surveys — Valuations
Corpus Christi—Houston—Victoria, Texas.

FAR WEST

International Engineering Company, Inc.

ENGINEERS
Investigation - Reports - Design
Procurement - Field Engineering
Domestic and Foreign
74 New Montgomery St.
San Francisco 5, California

Jacobs Associates

Consulting Construction Engineers
TUNNELS—DAMS
EARTHMOVING—FOUNDATIONS
Methods, Cost Estimates, Plant Design, Management, Surveys, Engineering Geology, Materials Handling
503 Market St., San Francisco 5, Calif.

Nevada Testing Laboratories, Ltd.

Engineering—Civil—Soils & Foundation Consultants—Field Testing—Soil Borings — Rock Drilling — Materials Field Control—Load Tests—Laboratory Testing—Soils—Concrete—Asphalt
300 W. Boston Ave. Las Vegas, Nev.

INSPECTION & TEST

Johnson Soils Engineering Laboratory

Foundation Design - Highway & Airport Pavements - Construction Control - Load Tests Shear & Consolidation Tests - MOBILE LABORATORIES
193 West Shore Ave., Bogata, N. J.
Bogata-Hubbard 7-4408

Pittsburgh Testing Laboratory

A national service-with complete laboratory and inspection facilities. Laboratories in principal cities.
Main Office: 1330 Locust St.,
Pittsburgh, Pa.

AERIAL SURVEYS

American Air Surveys, Inc.

AERIAL TOPOGRAPHIC MAPS & AERIAL PHOTOS FOR
• Highways • Airports • Power & Pipe Lines • Railroads • Mining • All types construction • Stockpile Inventories
907 Penn Ave. Pittsburgh 22, Pa.
Branches-Manhasset, N.Y.-Atlanta, Ga.

ESTIMATING

Estimators Ltd., Inc.

ACCURATE — CONFIDENTIAL
Professional Construction Estimators
Any Project — Anywhere
Main Office:
347 E. Market St., Long Beach 5, Calif.
Phones GArfield 3-0084 NEvada 6-5033
or Cable ESTIMINC

GEOLOGISTS

Geologic Associates

ENGINEERING GEOLOGISTS
Studies and Reports
Foundation Investigations
Specialized Drilling and Sampling
Brentwood, Tennessee
Phone (Nashville) VErnon 2-1748

GEOPHYSICISTS

Alpine Geophysical Associates, Inc.

Geophysicists-Engineers-Oceanographers
Land and Marine Foundation Surveys
Highways-Bridges-Tunnels-Buildings
Consultants-Earthquake-Oceanographic
10 Oak Street 2418 Tangley
Norwood, New Jersey Houston, Texas

ADVERTISERS IN THIS ISSUE

Aetna Casualty & Surety Co. 51
Allis-Chalmers 14-15
American Bridge Div., United States Steel Corp. 8-9
American Institute of Steel Construction 81
American Steel & Wire Div., United States Steel Corp. 72-73
Armco Drainage & Metal Products, Inc. 41

Bay City Shovels, Inc 76
Bethlehem Steel Co 78-79

Cast Iron Pipe Research Association 92-93
Caterpillar Tractor Co 61-68
James B. Clow & Sons, Inc 96
The Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div 36; 40; 52-53; 77; 85 96; 104
Concrete Reinforcing Steel Institute 77
Connors Steel Division, H. K. Porter Co., Inc. 101
Crown Zellerbach Corporation 18
Cubic Corporation 7

D-A Lubricant Company, Inc 49
Darling Valve & Manufacturing Co 74
Dodge Division, Chrysler Corp 82-83
Richard Dudgeon Inc 97

Engelhard Hanovia, Inc., Industrial Diamond Division 38
Esso Standard Oil 27
Euclid Div., General Motors Corp 89

Fireman's Fund Insurance Company 100
Ford Motor Company, Ford Div 30-31

Gardner-Denver Company 84
The Goodyear Tire & Rubber Co., Truck Tires Dept. 1
C. L. Guild Construction Co., Inc 94
Gunite Concrete & Construction Co 97
W. & L. E. Gurley 69

Hewitt Robins, Inc 99
Homelite Div., Textron Inc 56-57
Hose-McCann Telephone Co., Inc 85
The Frank G. Hough Co 6
The Hy-Dynamic Co 11

Ingersoll-Rand Company 106
International Harvester Co. (Motor Trucks) 102-103
International Nickel Company, Inc 105
Irving Subway Grating Co., Inc 58

The Jaeger Machine Co 80
Jenkins Bros. 16
Johns-Manville Corp. 86
Joy Manufacturing Company 59

Kern Instruments Inc 91
The Kinnear Mfg. Co 98
Kohler Co. 37
Koppers Company, Inc., Tar Products Div. 71

Le Tourneau-Westinghouse Co 42-43
E. J. Longyear Company 40
Ludlow Corporation 20

The Master Builders Company 3rd Cov.
Mobile Drilling, Inc 104
Moretrench Corporation 94

Naylor Pipe Company 50
Northwest Enginering Co 3

Owatonna Tool Company 70

Pittsburgh-Des Moines Steel Company 2nd Cov.
Posey Iron Works, Inc 98
Prestressed Concrete Institute 12-13

Reda Pump Company 97
Rodgers Hydraulic, Inc 36
John A. Roebling's Sons, Division, The Colorado Fuel & Iron Corporation 95

Sauerman Bros., Inc 55
Servicised Products Corp 98
Sheffield Div., Armco Steel Corp 29
Spencer, White & Prentis, Inc 60
Sprague & Henwood, Inc 80
Stacor Equipment Co 96
Symons Clamp & Mfg. Co 2

Texaco Inc. 4-5
Thew Shovel Co 112
E. A. Thompson Co., Inc 39

U. S. Steel Corp. 108-109
United Steel Fabricators, Inc 75

Waukesha Motor Co 10
Wheeling Corrugating Co 90-91
Williams Equip. & Supply Co 104
Worthington Corp. 4th Cov.

Professional Services 124-126

CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.

Employment Opportunities 119-121
Notices
  Proposals 115-118
Equipment
  (Used or Surplus)
  (For Rent, Sales Wanted) 121-123

ENGINEERING
NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

Member

Number of copies of this issue printed 87,476

D. S. ROBERTSON, Advertising Sales Manager
HUGH J. CARLSON, Business Manager
LANG CARPENTIER, Production Manager
JACK NEVINS, Assistant Production Manager

ADVERTISING REPRESENTATIVES

Atlanta, 9—1375 Peachtree St., N.E.,
Robert H. Powell, Jr.

Boston, 16—McGraw-Hill Bldg., Copley Square
C. D. Neulen

Chicago 11—645 North Michigan Ave.
L. H. Hunt, W. G. Payne, Earl S. Moore, Jr.

Cleveland, 13—1164 Illuminating Bldg.,
55 Public Square
H. A. Bergstrom, F. P. DiToro

Dallas, 1—Vaughn Bldg., 1712 Commerce St.,
John Grant

Denver, 2—Tower Building, 1700 Broadway
J. W. Patten

Detroit, 26—856 Penobscot Bldg.
R. I. Mace

Houston, 25—Prudential Bldg.,
Holcombe Blvd.—Joseph C. Page

Los Angeles, 17—1125 W. Sixth St.,
Knox Bourne, S. S. Tiebout

New York, 36—500 5th Ave.
C. D. Neulen, H. T. Olsen
Robert L. Barker

Philadelphia, 3—Six Penn Center Plaza
George K. Smith
Patrick Keleher

Pittsburgh, 22—4 Gateway Center
Malcolm Russell

Portland 4, Oregon—Room 445, Pacific Bldg.
Scott Hubbard

St. Louis, 8—Continental Bldg., 3615 Olive St.
E. B. Mingle, Jr.

San Francisco 11—255 California St.
John J. Hernan

OTHER SALES OFFICES:

United Kingdom, Edwin E. Murphy, 34 Dover Street, London W.1—Germany, Austria, Stan Kimes, 85 Westendstrasse, Frankfort/Main, Germany—Switzerland, Italy, France and Belgium, Michael R. Zeynel, 2 Place du Port, Geneva, Switzerland

---

ADVANCE CONSTRUCTION BUSINESS NEWS

For the
- **EXECUTIVE**
- **CONTRACTOR**
- **SALES MANAGER**
- **COST ESTIMATOR**

CONSTRUCTION DAILY—

A Complete Construction Business News Service:

For $225 per year (less than $1 per day) you get 253 NEWSLETTERS with proposed projects reports, current news and the special features below and 253 sets of REPORTS on bid dates, low bidders and contracts. These come to you by first class mail.

New proposed projects reported in the NEWSLETTER total over $21 billion per year in *future* buying power, new construction and building contracts in REPORTS total over $22 billion per year in *immediate* buying power.

Regular Special Features

EACH WEEK—Two special price & cost trend reports

Contract Awards by type of construction for week & cumulative

New Construction Financing:

EACH MONTH—Special reports include: Construction Contracts, Backlog of Construction Projects in the planning stage, in each of 50 states analyzed for 9 classes of construction.

A 3-month test offer

You can test the special benefits to you for three months at the quarterly rate of $65.

A bonus for starting now:

You get a two weeks (ten-day) service at no additional cost by entering your 3-months subscription this month.

Go after a big share of this construction volume—start your CONSTRUCTION DAILY Service NOW:

CONSTRUCTION DAILY
A McGraw-Hill Service
28th Floor—330 West 42nd St.,
New York 36, N. Y.

O.K.—Enter a three-month trial subscription to CONSTRUCTION DAILY at a cost of only $65.00 (this offer includes free copies for an additional 10 days). This offer covers daily copies of both the CONSTRUCTION REPORTS and NEWSLETTER—sent by 1st class mail. Or, if you prefer a year at $225 check here ☐

☐ Payment enclosed

Name .... Position........
Address ....
City........... Postal Zone...... State......
Name of Company....................
Type of Business...................

ENR—T1/3

Editorials

For Safety's Sake

All over the world, especially since the Malpasset Dam failure in France, dam designers are taking a new and sober look at all facets of their practice that might have a bearing on the safety of their structures. This is all to the good. And it will be particularly important to keep this sense of safety continuously sharpened since economic forces seem to be propelling designers toward ever longer and higher dams.

Two of the four questions discussed at this summer's International Congress on Large Dams, in Rome, lend emphasis to the necessity of being sure for safety's sake. The questions concerned respectively the use of concrete dams for wide valleys and the problem of sealing earth and rockfill dams.

One of the most telling arguments in favor of being sure was presented by J. Barry Cooke, supervising civil engineer of the Pacific Gas & Electric Co. Alarmed lest our progress in knowledge may not match the rapidity with which thin-core rockfill dams are being carried to unprecedented heights, he urged that detailed performance measurements be made on all high dams of this type. "Such measurements," he said, "provide the main substance for advancement in this field." Moreover, he emphasized that the resulting data should be presented and analyzed as rapidly as possible.

Mr. Cooke's concern was well documented. He noted that all our experience is with earth or rock dams less than 450 ft high. Nevertheless, already completed are several dams of about 500 ft including Trinity, which is 537 ft, while under design or in the early construction stages are, among others, Peace River Dam (over 600 ft), Oroville (730 ft) and three dams in Russia that vary from 800 to 990 ft high.

Since the settlement of dams of this kind may well be proportional to the square of their height, it will be necessary to design their cores for this magnitude of movement. Measurements such as Mr. Cooke urges would be most useful for such design, and give needed assurance of safety.

Some of this same kind of concern over progress in knowledge was voiced during consideration of the use of concrete dams for wide valleys. Here the problem is to develop some new type of structure or, alternatively and more likely, to adapt an existing type to a new use. In either case, design will have to be extended beyond the frontiers of actual experience.

For example, the most notable instance of a single arch across a wide valley is Kariba Dam in Africa—420 ft high and 2,025 ft long. It has an aperture of 4 (ratio of chord length to height), so that if larger apertures are to be considered, even more critical design decisions must be made than were required for this remarkable structure.

Again, if multiple-arch designs are considered for wide valleys, economy will probably suggest that longer spans than are customary should be used, which will introduce new problems of arch thickness and reinforcing as well as make foundation design more critical. Other types of concrete dams that have been considered for wide valleys, such as hollow buttresses or prestressed gravity sections, will also merit the most careful attention to assure their absolute safety.

Dam designing is a demanding art. One of the greatest demands is to keep knowledge at least abreast and preferably ahead of practice. This demand is pressing with respect to higher earth and rockfills and to high concrete structures for wide valleys. For safety's sake we must be sure that our knowledge is adequate.

Danger Is Never Absent

A door slams shut—and five lives are snuffed out. It was an accident like any other accident in that it should not have happened, yet did. It was also a freak accident, as so many are, in that it could hardly have happened any place else. Again it emphasizes that danger is never absent on a construction job, and that eternal vigilance is the price of safety.

The door was one of the two horizontally hinged masses of concrete that come down as a blast-proof cover for a subterranean missile silo near Denver. A shiny new hydraulic ram held the door open as construction of the finishing-touch type went on in its shadow on the rim of the deep silo. The massive door, open as it would be for the raising and firing of the missile, crushed those killed on the rim of the silo, threw others, injured, into a safety net below.

The five men killed were part of a capable construction team that had come through two years of hazardous underground construction with a commendably low accident rate and no fatalities. They were working that fatal day on a project that was virtually finished—save for the finishing touches.

The tragedy occurred only three days after there had been a celebration of the completion of the heavy construction phase of this first facility for a squadron of Titan I missiles. The safety-conscious contractor celebrated acceptance of this portion of his job by the Corps of Engineers; the safety-conscious Corps had celebrated with the contractor by presenting him a safety award. The fine and fitting ceremonies were marred somewhat by an accidental death only hours before; a man on the installation and testing phase of the work had fallen into one of the silos. But the construction itself had been done without a death. It was on the very next working day that the door fell.

It was tragic that these men should have died the way they did, so close to finishing their work safely. The accident offered new proof, not really needed, that no construction job is ever safe until it's done.

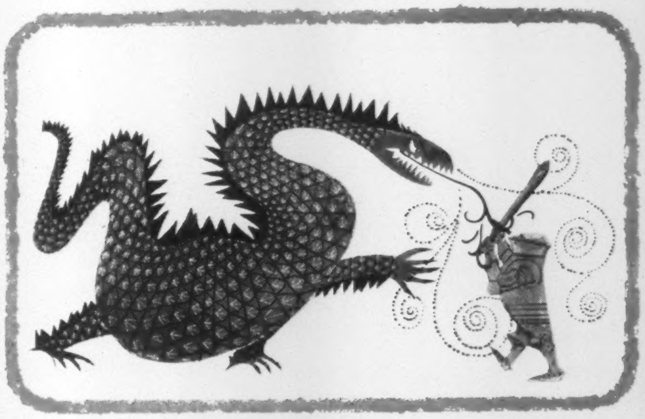
A FABLE ON FLOORS . . .

"IRON ARMOURED" PROTECTION

1. No matter what type of floor you install . . .

2. Wear takes place at the surface.

3. For the most wear-resistant floor surface . . .



4. A surface that will withstand abrasion, impact, point loads, oil absorption, leaks, spalling, dusting . . .

5. "Iron-Armour" the surface with MASTERPLATE . . . and conquer your flooring problems!

ADJOINING FLOORS
Plain Concrete Floor
Surface worn out replaced after 8 years.
MASTERPLATE Floor
Surface in good condition after 12 years.

6. Compare the wear—adjoining floors . . . same heavy traffic on both.

MORAL: Win the battle of industrial floor wear . . . assure 4 to 8 times longer floor life by installing . . .

MASTERPLATE
CONCRETE FLOORS

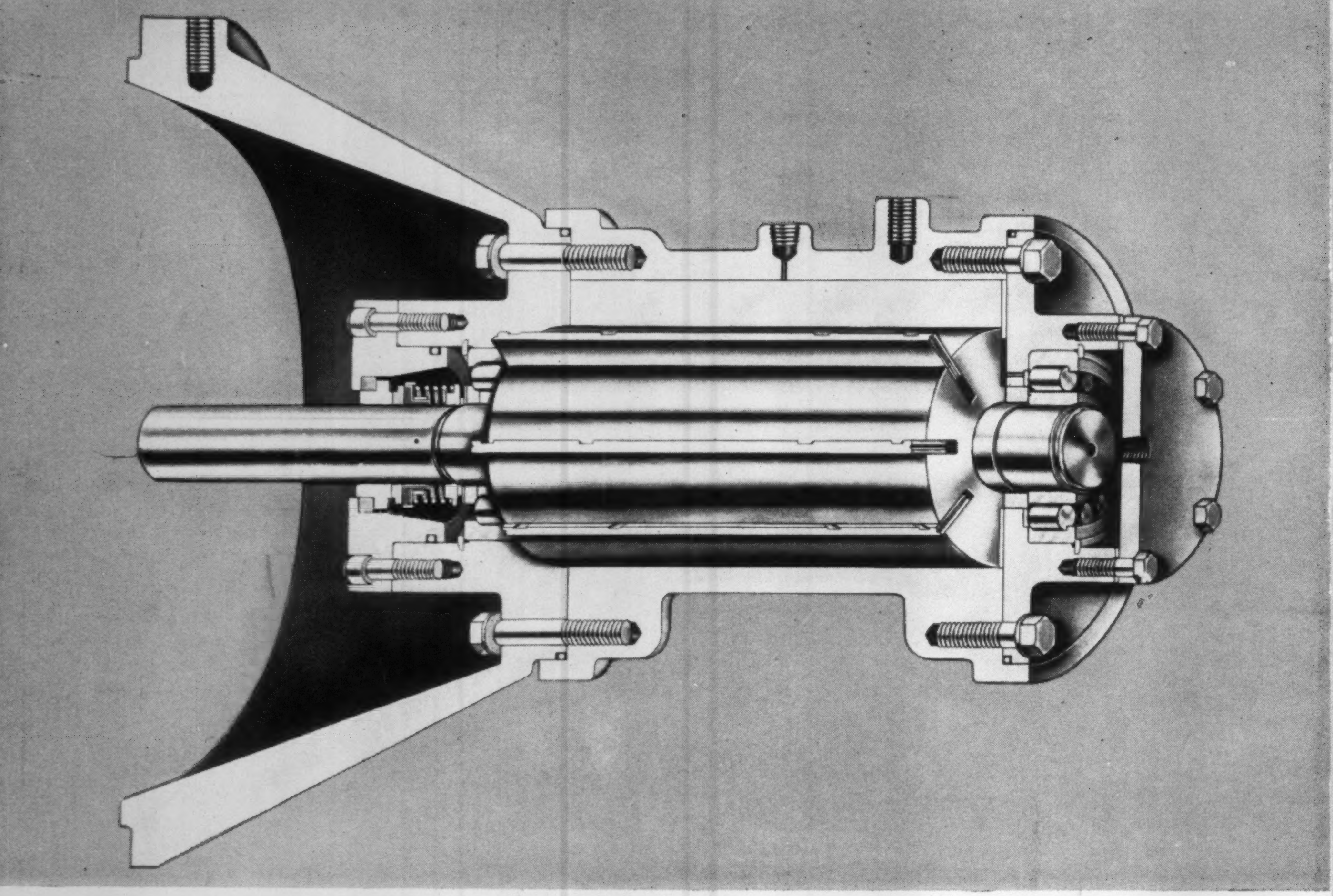
FREE 16-PAGE BOOKLET
. . . with full details on applications, advantages and specifications for MASTERPLATE iron-armoured metallic aggregate floors. Write for your free copy.

MASTER BUILDERS.®
MASTERPLATE*

*MASTERPLATE is a registered trademark of The Master Builders Co. for its specially-prepared, metallic aggregate for producing "iron-armoured" concrete floors.

The Master Builders Company • Division of American-Marietta Company • Cleveland 18, Ohio
World-wide manufacturing and service facilities

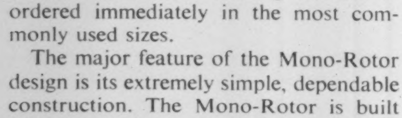
WORTHINGTON COMPRESSOR NEWS:



NEW MONO-ROTOR INTRODUCED IN 85′, 125′ AND 250′ MODELS

Now Worthington introduces the new Mono-Rotor Blue Brute compressor—a significant step ahead in improving compressor performance. The Mono-Rotor introduction follows six full years of development and field testing. It can be ordered immediately in the most commonly used sizes.

The major feature of the Mono-Rotor design is its extremely simple, dependable construction. The Mono-Rotor is built with just one stage . . . just one rotor . . . just two bearings . . . no gears . . . oil pump.



NEW 125′ MONO-ROTOR COMPRESSOR

It is simpler in construction than any two stage compressor or any screw type compressor. This simple construction is the basis of its high degree of reliability.

How reliable is the Mono-Rotor? Its reliability is so great that Worthington has quadrupled its warranty period. The standard warranty agreement has been extended from the usual 90 days to one full year. Worthington is the first compressor manufacturer supplying the construction industry to do so.

What makes the new Mono-Rotor design so successful? It is the new Worthington-developed rotor-to-cylinder sealing. For over ten years the industry has attempted to solve this problem for larger compressor sizes. Two-stage construction was the solution until Worthington developed new methods of oil distribution within the cylinder. Now an efficient, dependable air supply is available in just one stage—one rotor construction.

The new Worthington Mono-Rotor units have other benefits, too. They are 20% lighter in weight and are designed for improved towing and tracking. The third wheel is standard equipment for easier handling on the job. There is an engine-saving clutch and many other features.

The Mono-Rotor Blue Brute can now be ordered in the 85′, 125′ and 250′ sizes. See it . . . rent it . . . or buy it at your Worthington dealer listed in the Yellow Pages under "Compressors." Or write Worthington Corporation, Dept. 60-37, Holyoke, Mass. In Canada: Worthington (Canada) Ltd., Brantford, Ontario.

WORTHINGTON

PRODUCTS THAT WORK FOR YOUR PROFIT